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ABSTRACT

An earlier report on the progress of Individually Prescribed Instruction (IPI) is brought up to date with summaries of known materials dealing with several aspects of IPI. Part 1 of the report provides a general description and findings of IPI to date. Part 2 provides specific subject description and reviews in abstract format and formative and summative studies. Part 3 presents a comprehensive annotated bibliography. (SK)

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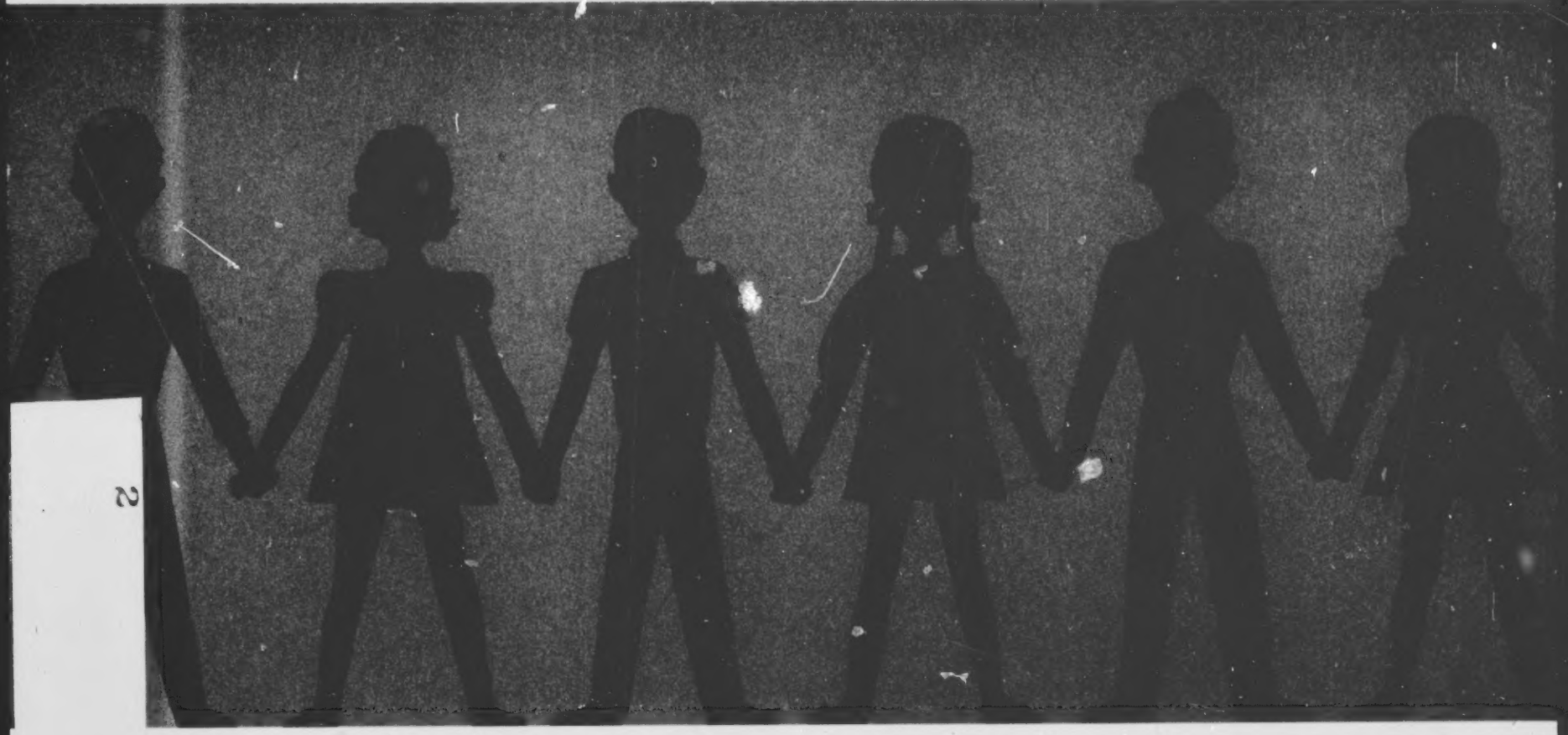
PROGRESS REPORT II: Individually Prescribed Instruction



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Research for Better Schools, Inc.

March, 1971

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FOREWORD

Progress Report II is a continuation of the efforts of Research for Better Schools, Inc. to provide for a variety of audiences descriptive and evaluative information about Individually Prescribed Instruction.

The total worth of the instructional system, Individually Prescribed Instruction, as one means of providing individual learning for children, will never be known. This report does however reflect major trends, but should not be construed to mean that IPI is the panacea for solving all educational ills of American schools. As an instructional system designed to develop and foster self-initiation, self-direction and self-evaluation, IPI typifies what can be done to help resolve the age-old problem of providing for each student, each day, his own program of studies.

The Learning Research & Development Center of the University of Pittsburgh and Research for Better Schools, Inc., an Education Laboratory based in Philadelphia, have been cooperating in the development, field testing, and dissemination of Individually Prescribed Instruction since June 1966. The operational demands of IPI within the school setting demands a changed role for administrators, teachers, and students. This report summarizes known studies dealing with many aspects of IPI. Not only studies conducted by LRDC and RBS, but those conducted by local schools are included.

The Progress Report is divided into three major parts. Part I deals with the general description and findings of IPI to date. Part II provides specific subject description and reviews in abstract format formative and summative studies. And Part III presents a comprehensive annotated bibliography. Each reader is urged not to use any one datum as a means for acclaiming or disclaiming the total instructional system of Individually Prescribed Instruction. Continual evaluation and strengthening of the IPI curricula and instructional procedures is the purpose of data feedback, therefore permitting continued improvement in a systematic way. No results will ever be final.

Robert G. Scanlon
Program Director

James W. Becker
Executive Director

March 1971

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PART I.

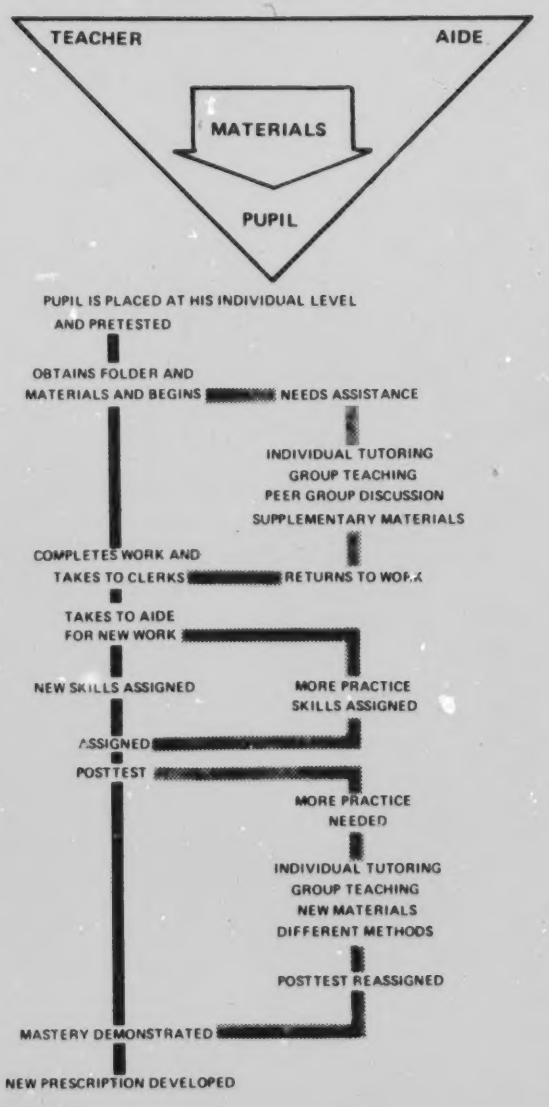
GENERAL DESCRIPTION AND FINDINGS TO DATE

INDIVIDUALLY PRESCRIBED INSTRUCTION (IPI) IS ONE METHOD OF PROVIDING FOR INDIVIDUALIZED INSTRUCTION

IPI IS AN INSTRUCTIONAL SYSTEM THAT INCLUDES:

- Placement tests and a prescription technology designed to place learners into their own properly tailored instructional content.
- Pretests to determine what the learner already knows about the content being taught.
- Instructional materials built around specified objectives for the content being taught.
- Checkpoints in the curriculum to guide the learner in measuring his individual progress.
- Posttests to measure the overall mastery of a unit of instruction.
- A management system for teachers.
- Training programs in the use of the instructional and management system for administrators, teachers, and teacher aides.
- A monitoring and data feedback network designed to improve the instructional and management system.

A FLOW OF THE IPI SYSTEM



FROM RESEARCH TO IPI THROUGH FEDERAL SUPPORT

1954 →	1963 →	1966 →	1966 →
EXPERIMENTAL RESEARCH	**RESEARCH & DEVELOPMENT**	**DEVELOPMENT & DISTRIBUTION**	**APPLICATION**
Individual Researchers	**Learning Research & Development Center Funded by U.S.O.E.**	**Research for Better Schools, Inc. Funded by U.S.O.E.**	**Learners and Target Populations**
Typical Efforts: • Programmed Instruction • Rate of Learning • Pacing • Individual Differences	Typical Efforts: • Synthesize Knowledge • Develop Model for Individualization • Create Experimental School • Oakleaf (IPI) Started	Typical Efforts: • Select IPI as Major Program • Develop Training Systems • Develop Feedback Loop • Develop Wide-Scale Adoption System	Typical Efforts: Instructional Systems – • Mathematics • Reading • Spelling • Handwriting • Science

A MODEL FOR EVALUATION OF IPI

Evaluation of Objectives

- Adequacy of form of statements.
- Relationship to a philosophy, basic purpose.

Study of Relationship of Objectives and Plan

- Does plan show promise achieving objectives?
- Does planning suggest modification of objectives?

Study of Relationship of Operation and Plan

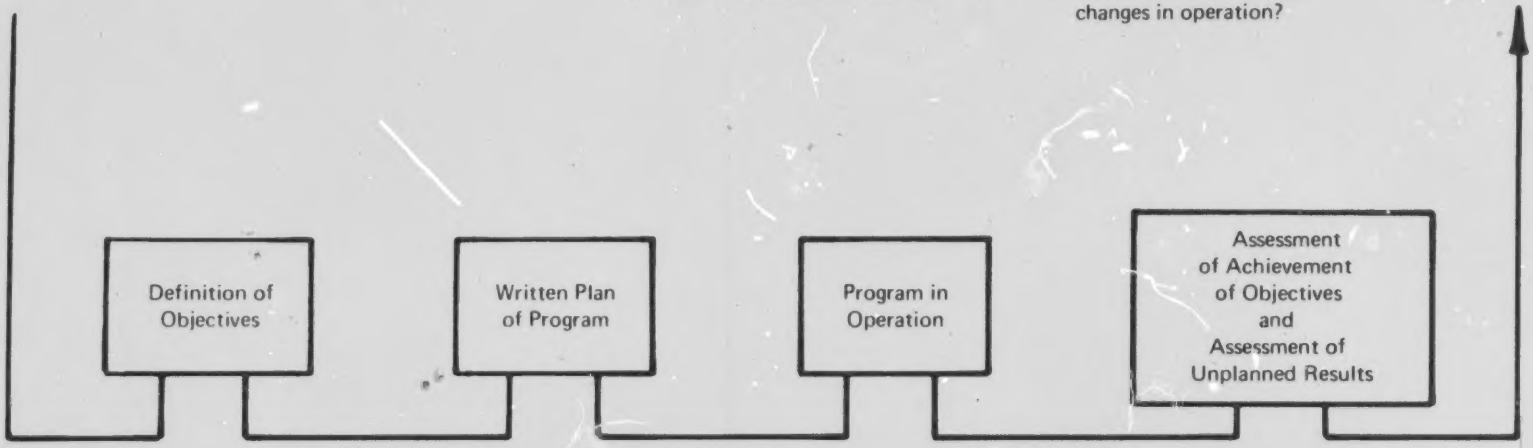
- Is plan specific and complete?
- Is operation as per plan?
- Does operation suggest modification in plan?

Study of Relationship of Operation and Assessed Results

- Does operation produce desired results?
- Does operation produce unplanned results?
- Does assessment suggest changes in operation?

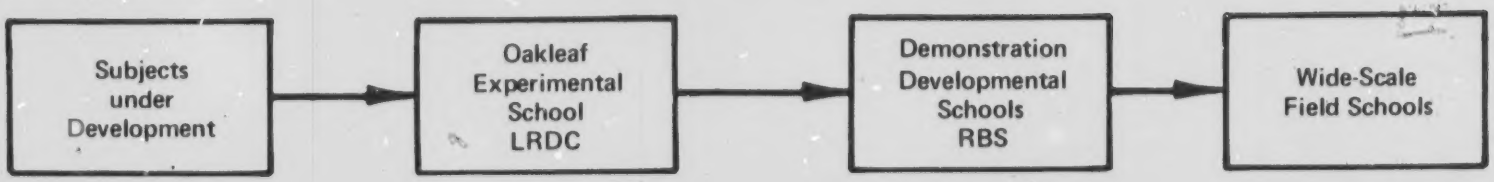
Study of Relationship of Immediate Results to More Ultimate Goals

- Does achievement in program correlate with later achievement?
- Are unplanned results negative or positive?


Definition of Objectives
Written Plan of Program
Program in Operation
Assessment of Achievement of Objectives and Assessment of Unplanned Results

NUMBER OF IPI SCHOOLS BY STATE – 1970—1971

ELEMENTARY SCHOOL DEVELOPMENTAL EFFORTS



Subjects under Development	Oakleaf Experimental School LRDC	Demonstration Developmental Schools RBS	Wide-Scale Field Schools
• Mathematics	1965	1966	1967
• Reading	1965	1967	1970
• Spelling	1968	1969	1971
• Handwriting	1968	1969	1971
• Science	1968	1969	1972
• Social Studies	1972	1973	1974

IPI RESULTS OF WORK TO DATE

THE FOLLOWING HIGHLIGHTS, GENERAL IN NATURE, PRESENT AN OVERVIEW OF SOME OF OUR WORK TO DATE. THE RESEARCH RESULTS HIGHLIGHT THE FOLLOWING:

- *Teachers* can replicate the IPI system, thus insuring feasibility for wide-scale adoption.
- *Teachers* have positive attitudes toward teaching under IPI, use data to make decisions, to change their behavior in working with students and provide valuable feedback for improving the system.
- *Students* achieve as well or better than non-IPI students on standard tests, achieve higher than non IPI students on IPI tests, have a positive attitude toward schools and learning, and demonstrate a change in social behavior.
- *Parent reactions* have been highly positive indicating that their children like school better. Parents also feel that IPI considers individual differences and is a successful experience and that IPI is superior to traditional mathematics programs.
- *Administrators* can be taught to use the system, become the instructional leaders for their own staff and use data to manage the instructional system.
- *The IPI system* has produced effective results with a variety of populations: disadvantaged, rural, mentally retarded as well as regular populations.

PART II.

PROGRAM DESCRIPTION: FORMATIVE AND SUMMATIVE EVALUATIONS

MATHEMATICS

READING

HANDWRITING

SPELLING

SCIENCE

GENERAL

FORMATIVE – SUMMATIVE EVALUATIONS

The evaluation of any new program is extremely difficult. At times the instruments necessary for evaluation are non-existent and have to be invented; also, the evaluation of any new program cannot be treated in the same manner as experimental research in that changes, many times dependent upon observations and value judgments, have to be made to correct identified weaknesses of the new program being evaluated.

IPI, as an instructional system, does not escape any of the above problems. To date over 224 studies have been generated. Approximately ninety of these studies have been selected and presented in Part II in summary form. Descriptive studies about the instructional system have not been included in this section but can be found in Part III – **An Annotated Bibliography.**

It should be further noted that the data do not always agree. Such phenomena are not rare in educational research and evaluation. Evaluators, like all other humans, tend to agree to disagree. When value judgments have to be made disagreements are bound to arise.

Part II presents formative and interim summative evaluations which have been highlighted from on-going and completed studies – all of which are listed in Part III.

No attempt has been made to deal with the composite results of Part II. In a sense this is an experiment on the part of RBS in presenting what are believed to be the relevant facts concerning author, title, date, population, instruments, description, and results. The truth is that nobody knows exactly what the best form is in presenting such findings. It is hoped that this approach provides reader ease, as well as direct communication in a concise, meaningful manner.

A brief description of formative and summative evaluations is presented, followed by the data to date.

MATHEMATICS

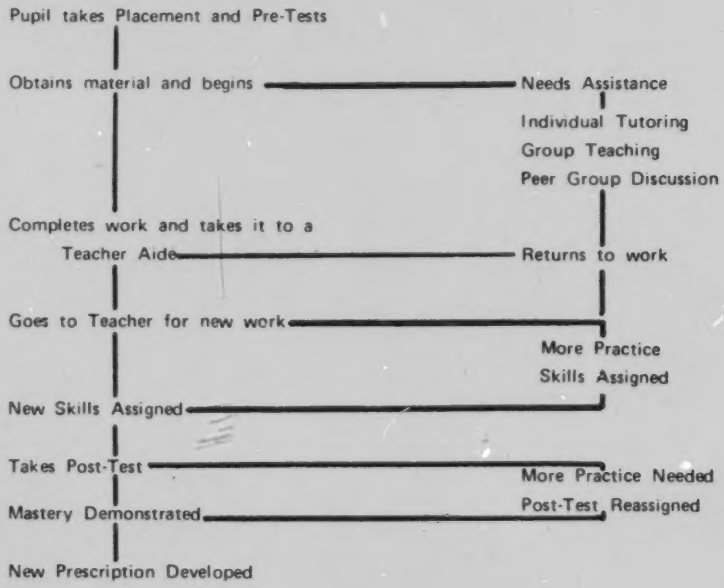
MATHEMATICS

IPI Mathematics is based upon a carefully sequenced and detailed listing of 363 instructional objectives. Specific teaching methods, learning materials, and diagnostic instruments are correlated with each objective.

IPI Continuum 1970 – 1971

UNIT (CONTENT AREA)	LEVELS A	B	C	D	E	F	G	Objective Totals
Numeration/Place Value	15	9	12	4	8	3	4	55
Addition/Subtraction	19	13	8	9	3	4	6	62
Multiplication	0	4	4	5	8	5	5	31
Division	0	2	6	5	7	5	7	32
Fractions	3	4	7	9	13	10	5	51
Money	2	1	5	4	0	0	0	12
Time	1	5	7	3	3	0	0	19
Systems of Measurement	0	4	6	5	5	5	8	33
Geometry	0	3	3	5	5	4	4	24
Applications	0	3	7	10	10	5	9	44
Objective Totals	40	48	65	59	62	41	48	363

STUDENT ACTIVITIES



MATHEMATICS – FORMATIVE

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Bialeck and Castro – A Second Year Evaluation of Individually Prescribed Instruction (IPI). Monterey, California Nov. 1968	Five 4th grade students.	Interviews with five students.	Three interviews were held with each student at intervals of six weeks starting in January.	To the pupils, IPI made math more enjoyable. Pupils do feel competitive. Tests elicit ambivalence: an enjoyment over the end of work or beginning of new material coupled with anxiety over finding out possible failure.
Bolvin - (LRDC) - Variability of Pupil Achievement in Mathematics Feb. 1966	Oakleaf, before and after the introduction of IPI	–IPI tests –Metropolitan Achievement Test	IPI tests are given at the beginning and end of the first year of IPI and the results in units mastered are compared by grade. Variability data is also obtained on the Metropolitan at the beginning of the year.	In grades 1, 4, 5 and 6, variability in achievement after a year of IPI was no greater than in standard graded instruction. Variability on the Metropolitan showed a general increase with number of years in school.
Bolvin - (LRDC) - Evaluating Teacher Functions - Feb. 1967	Oakleaf teachers in the first two years of IPI.	Prescription sheets	Teachers' prescriptions were reviewed and length and types of prescriptions tabulated. The analysis of type seems to be largely subjective.	Two patterns of prescribing were identified. Prescription practices seem to be limited by the curriculum materials and student information readily available to the teacher. Some changes in practices were observed over the two years.

MATHEMATICS – FORMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Bolvin - (LRDC) - The Use of Field Data for Improving IPI Materials and Procedures Feb. 1969	IPI pupils in 25 schools	Prescription forms (math)	Analysis of prescription variability.	Number of pages prescribed vary among pupils; instructional techniques prescribed did not.
			To determine if all 390 objectives in the math program are necessary.	Particular skills in which large numbers of students had a pretest mastery indicated a need for eliminating some objectives.
			Analysis of diagnostic instruments to determine learning problem areas.	An analysis of CETs and pretests required for mastery identified some units in which materials were inadequate, objectives were missing, and posttests provided inadequate sampling of outcomes.
Boozer - (LRDC) - Evaluation of Variability Among Students in Total Number of Units Mastered per Year. Summer 1968	Oakleaf pupils 1967-68	IPI tests for units in which work was done.	1967-68 variability data for each grade at Oakleaf is compiled utilizing the Pitt time-sharing computer terminal system.	Variability in pupil achievement occurs in both math and reading. Variability is greater at the higher grade levels. The time-sharing system can be utilized to conduct small data analyses such as these quickly.

MATHEMATICS – FORMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Cox, et. al. - (LRDC) - Description and Evaluation of the First Two Years of IPI Dec. 1966	Oakleaf School pupils 1964-66	IPI posttests	Study of retention of mastered units during the school year and over the summer.	Most units are retained, with great gains in some units over the summer.
	Oakleaf teachers 1964-66	Prescription sheets	Study of prescription writing practices.	Certain teachers tend to develop a few set patterns of prescription writing which fail to take actual pupil performance into account.
		Interviews	Teacher attitudes and recommendations.	All teachers were in favor of individualization of instruction, and felt that it fostered pupil interest, self-motivation and independence. Major problem is the handling of the slow child. They found the initial adjustment to teaching IPI difficult, but felt it made for more efficient utilization of their time.
	Oakleaf School pupils 1964-66	IPI tests Prescription data	Variability and rate of achievement (ratio of pages to days up to the first posttest) in Math.	Great variability between units and large individual differences within units. Middle math levels (C-E) take the most pages and days to mastery.

MATHEMATICS – FORMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Cox, (Continued)		IPI tests Prescription data California test of Mental Maturity Metropolitan Achievement Test	Correlation of math and reading rates with selected variables.	Significant correlations (positive and negative) were found between: – math and reading rates – math/reading rates and IQ – math rate and Metropolitan math achievement score – first math posttest and days in math pages in math IQ post and present Metropolitan Reading and Math test scores.
DeRenzis (RBS) - An Investigation into the Attitude Patterns and their Relationship to Prescription Writing Procedures of Teachers Using the IPI Instructional System in Elementary Mathematics - 1970	208 IPI teachers 31 schools	Runner Studies of Attitude Patterns IPI mathematics prescription sheets	Teachers consenting to participate in the study completed the Runner questionnaire. Their attitude responses were compared with the patterns of variability in the prescription sheets.	The Runner interview effectively identifies rigidity, flexibility, and over–flexibility among teachers using IPI.

MATHEMATICS – FORMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Dudley, et. al. CASEA - The Decision-Making Structure of Schools Feb. 1969	3 IPI schools 3 Control schools 3 Multi-unit for Project Models (Wisc.) 3 Multi-unit Control Schools for Project Models (Wisc.) 6 Wash. (state) schools	Questionnaire	To determine the decision-making process of schools and the teacher perceptions of the authority structures, the following questions were asked: – What positions had primary responsibility for making decisions? – What is the nature of the relationship of people involved in each decision?	Variability within types of schools (control, multi-unit and IPI): – Control: teachers see themselves as decision makers with the principal as a consultant. – Multi-unit: decisions are made in committees, not by individual teachers but each school had different authority structure. – IPI: no clear, consistent pattern with a trend toward a prescription type of authority relationship.
Deno - Jenkins (University of Delaware) – Evaluating Pre-planned Curriculum Objectives 1967.	13 in-service teachers and one principal	IPI Continuum Classification check-list	Purpose of study was to determine whether a technique for analyzing behavioral objectives in terms of critical components (such as specificity of behavior; context and determined criterion of the objective) could be developed and reliably used by a typical group of in-service teachers.	Concluded that nearly every objective sampled from the IPI math continuum may be described as a general behavioral objective with neither a signal nor a criterion explicitly stated.

MATHEMATICS – FORMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Eidell, et. al. CASEA - Uniformity and Variability in the Organizational Characteristics of Elementary Schools - Feb. 1969	3 IPI schools 3 Control schools 3 Multi-units schools for Project Models (Wisc.) 3 Multi-unit control schools for Project Models (Wisc.)	Four instruments measuring: – Job satisfaction – Pupil control orientation – Reference group orientation – Leadership of school principals (Items adapted from Halpern & Croft OCDQ)	The four instruments were administered in a two-hour session after school.	JOB SATISFACTION Instrumental (work) ranking of highest to lowest Multi-unit experimental Multi-unit control IPI control IPI experimental Multi-unit consistently higher than IPI. Expressive (interpersonal) - same as above in ranking, but no significant differences in magnitude. (NOTE – Tries to attribute differences to regional variations.) PUPIL CONTROL IDEOLOGY (Humanist to custodial) – Rank order from most humanistic: Multi-unit experimental Multi-unit control IPI experimental IPI control REFERENCE GROUP ORIENTATION (Cosmopolitan to local) – Rank order from most cosmopolitan: IPI experimental Multi-unit experimental Multi-unit control IPI control

MATHEMATICS – FORMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Eidell, (Continued)				LEADERSHIP Aloofness – Rank order from most aloof: Multi-unit control IPI experimental Multi-unit experimental IPI control Consideration – Rank order from most 'human': Multi-unit experimental Multi-unit control IPI control IPI experimental Production Emphasis (Degree of Close supervision) – Rank order from most directive: Multi-unit control IPI control IPI experimental Multi-unit experimental Thrust (Attempt to motivate via example) – Rank order from highest to lowest: Multi-unit control Multi-unit experimental IPI control IPI experimental

MATHEMATICS – FORMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Eidell, (Continued				SUMMARY – Variation according to geographic location – Greatest differences are found between IPI experimental and multi-unit experimental – Few interpretations offered.
Fairgrieve - Evaluation of the IPI Math Program at McMorrow School – 1969	31 parents	Questionnaire	31 of 52 questionnaires or 60% were returned.	The parents responding felt favorably about IPI in their opinion and their impression of their children's feelings.
Foust - Walnut Lake Developmental Plan Individually Prescribed Instruction Report 1968 - 1969, June 1969	Parents	Questionnaire	Questionnaire completed during Parent - Teacher Conferences.	Parents are satisfied that their children are in IPI math. Pupil reaction to their parents is that the majority are excited about being in IPI.
Independent School District 273. IPI Evaluation Highlands Elementary School - 1970	180 parents	Questionnaire	55% of the parents responded. Ratings of 1 to 5 were given on items pertaining to objectives, operations & evaluation of IPI.	Parents feel that IPI considers individual differences and is a successful experience. Pupils are being challenged (60% nearly always, 31% usually). Teachers have a good understanding of child's math ability (78% nearly always, 13% usually).

MATHEMATICS – FORMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Independent, (Continued)				Child has progressed satisfactorily in math (52% equal to, 34% above expectations) and attitude has become more positive toward math (85%). Parents would want their children to continue in the program (91%). IPI is superior to the traditional math program (89%).
Glaser - (LRDC) - Adapting the Elementary School Curriculum to Individual Performance Oct. 1967	Oakleaf School	Prescription data	Effort was made to use the computer to keep track of pupil progress and to generate reports of achievement.	Report format developed was a computer output of a line graph for the individual pupil showing his accumulated progress in terms of units mastered over time. The slope of the graph is a measure of his rate of achievement. This type of output might be used as a 'report card.'
Hoeltke & Gilchrist - An Evaluation of the Educational Program of Pawnee School District 110, 1969.	32 IPI teachers	Written opinion	Anonymously written opinions were evaluated.	As a group, the teachers are happy with the curriculum. Of the 32 opinions, only one was critical of IPI math.

MATHEMATICS – FORMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Hoeltke, (Continued)	443 parents	Questionnaire	Of the two questionnaires mailed to each household for a total of 1,120, 443 or 39.6% were returned. Frequency - percent of responses per item are presented.	Arithmetic is a very important subject (97%) and the school is spending the right amount of time (72%) or too little (27%) time on arithmetic.
Lipson - (LRDC) - Transfer and Generalization in IPI Feb. 1966	Oakleaf students 1964 - 66	IPI continuum	Use of transfer instances (those cases in which the student has received instruction in prerequisite skills, and then shows mastery on advanced dependent skills) as a comparative measure of transfer.	Probability of transfer increases as the student's background in arithmetic increases. Addition and Subtraction show greater probability of transfer than do Multiplication and Division. The percentage of students in a class showing transfer behavior increases linearly by grade.
O'Keefe - (LRDC) - Use of Placement Tests in IPI Math July 1968	Oakleaf pupils Grades 5 and 6	IPI materials	The control group began work on unit indicated by placement test results; the experimental group began work at the level on which they were working the previous spring, regardless of placement test score.	Pupils in the experimental group spent considerably less time in working on previously mastered units. There was no correlation between score on the placement test and time taken to complete a unit.
RBS - Summary of IPI Teachers' and Administrators Conference Feb. 1967	79 teachers and 18 administrators from 12 IPI schools	Reports on wo[illegible]ops	Discussion of administrative and teacher training used in IPI and recommendations for the future.	Suggestions were made for individualized teacher training procedures and more practice in using IPI procedures as a part of the training.

MATHEMATICS – FORMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
RBS, (Continued)			Discussion of problems of interaction between student teacher, teacher-teacher, teacher-administrator, and teacher system.	Changing roles included: – A shift of responsibility from teacher to the student with the teacher being more responsive to student needs. – More communication and cooperation among teachers. – More communication with the administration. – Teachers must be able to teach and know varied content simultaneously.
		Teacher questionnaire	Short teacher questionnaire included two multiple-choice questions about attitude toward IPI, several evaluating and conference sessions, and two open-ended questions asking for opinions of the strength and weaknesses of IPI.	– Importance of the teacher increases in IPI. – IPI is a step toward superior classroom with specific strengths including materials, motivation of pupils, and role of teacher. – The need for refining the skill sheets was selected as the major weakness.
		Administrative questionnaire	Short administrator questionnaire included two multiple-choice questions about attitude toward IPI, several evaluating the conferences sessions, and two open-ended questions asking for opinions of the strengths and weaknesses of IPI.	– Importance of the administrator increases in IPI. – IPI accomplishes the goal of individualizing instruction, increases teacher and student motivation, and provides more time for the teacher to teach.

MATHEMATICS – FORMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
RBS, (Continued)				– The two major weaknesses pointed out included teacher and administrative training, and the need for refining the materials.
RBS - Summary of IPI Teachers' and Administrators' Conference March 1968	147 IPI teachers from 25 IPI schools	Workshop reports	19 workshops were held in which teacher recommendations were made in topic areas.	Most teachers believed workshops were helpful. Specific recommendations were made for: – seminar topics for math and reading – time and structure of planning sessions – classroom management – math and reading readiness activities – teacher evaluation by principals and self-evaluation – prescription writing – reporting progress to parents – techniques used to take into account learning characteristics – public relations.
		Questionnaire	Administration of opinionnaire in which teachers rated certain aspects of IPI on a scale from 'excellent' to 'poor' and made specific comments.	Results from the questionnaire can be summarized as follows: – Teachers felt IPI math best for average or above average pupils, and that classroom atmosphere, motivation and discipline were good.

MATHEMATICS – FORMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
RBS, (Continued)				– Teachers generally liked their own role in IPI but were critical of their training. – About half of the teachers felt the instructional materials were good; others felt them adequate or needed improvement. – Only one-third of tne teachers felt planning sessions were good or excellent. – Most were in favor of seminars. – Most felt IPI made more demands on the teacher than previous systems. – Most felt aides were effective. – Many seemed to have changed their opinion of IPI from negative to positive since its introduction into their school. – Comments during conference sessions showed teachers felt program also benefits below average pupils because it helps to maintain their interest.

MATHEMATICS – FORMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Sandvick - An Evaluation of IPI (math) Procedures, Carman School 1968-70.	IPI faculty and teachers of control pupils	Questionnaire	Using a rating scale, teachers were asked to rate descriptive phrases.	As a group, IPI teachers are more accepting of and oriented towards individualization of instruction than are control teachers. IPI teachers feel it unnecessary to have a textbook for each grade, but control teachers are ambivalent. IPI teachers are more acceptant of the innovation.
	238 parents	Questionnaire	238 or 387 questionnaires or 62% were returned.	Of the parents responding: - 90% feel their children are showing progress in IPI math. - 87% indicated their children have discussed IPI at home and only 2% of the pupils expressed dislike compared with 66% expressing a liking for it. - 44% indicated approval - 35% indicated lack of knowledge of IPI.
Scanlon - (LRDC) - Self-Initiated Activities in an Individualized Program - 1966	Oakleaf 5th and 6th grade students and teachers	Measure of self-initiated behavior Measure of student interest	Three treatments, introduced one per month, were used over a four-month period. Treatment #1 was designed to create awareness and use of supplementary materials.	Self-initiation can be improved by providing special techniques during class periods. There is little relationship between self-initiation and IQ achievement or sex of student.

MATHEMATICS – FORMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Scanlon, (Continued)		Measure of peer-group evaluation of initiation	Treatment #2 provided opportunities to explore special interest areas.	Student interest in math did not increase after self-initiation treatments, nor was there any significant change in peer evaluation of self-initiation.
		Student interviews		
		California Test of Mental Maturity	Treatment #3 was designed to capitalize on special interests and to structure opportunities for teachers and peers to praise exceptional work.	Interviews showed that pupils wanted to continue the treatments, and believed these provided them the chance to work on their own, teach themselves and go at their own speed.
		Metropolitan Achievement Test		
Scanlon - (RBS) - The Use of Data in School Selection and Training of Administrators Feb. 1969	Teachers in two new IPI schools	Two school case studies	Field testing and refinements of individualized teacher training materials.	An application for new schools with specified criteria for their selection.
		Pre- and posttest in training materials		
	60 IPI administrators	Questionnaire I: (ATP)	Administrative training program was held in the spring of 1968.	Development of an administrative training program to enable principals to train their staffs.
				Response to the training program was quite positive. Administrators ready to train their staffs.

MATHEMATICS – FORMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Scanlon, (Continued)	Teachers in 70 IPI schools	Teachers' evaluation of training program and materials. Trainer's report of procedures used in training session. Trainer's summary and evaluation report.	Teacher training program held during the summer of 1968.	Teacher and trainer evaluation of the individualized training program and materials was quite positive. Marked cost reduction realized by this new approach to staff training.
Stehr, et al. CASEA - Task Differentiation in Elementary Schools: An Exploratory Analysis Feb. 1969	3 IPI schools 3 Control schools 3 Multi-unit schools for Project Models (Wisc.) 3 Multi-unit control schools for Project Models (Wisc.) 6 Washington (state) schools	Organization task instrument	The instrument was designed to elicit an extensive job description from each teacher and the ranking of the tasks listed according to their importance and the time it takes to carry them out.	Task area with greatest number of responses: – IPI 'management' with 18.4% – IPI control: 'management' with 20.8% – Multi-unit: 'planning' with 22.5% All schools are almost equal on the frequency of 'evaluation'. Organization of the school does not affect the frequency of: guidance, professional advancement, growth, and teacher content areas, meetings, planning, PR, stimulation-motivation, and teacher-instructional activities. Most important tasks were for: – IPI management – Multi-unit: evaluation

MATHEMATICS – FORMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Stehr, (Continued)				When time is the factor, the following is important for: – IPI: evaluation, stimulation-motivation – Multi-unit: guidance TENTATIVE CONCLUSION – IPI schools seem to have a far greater impact on the task structute of teachers than multi-unit schools.
Unks - (RBS) - iPi Mathematics: A Report on the Results of 1967-68 Prescription Data Analysis May 1969	4,685 pupils in 19 IPI schools	IPI mathematics prescription sheets	Prescription data for each skill including such items as pages used, test scores, days spent in skill was summarized. Printouts of the summaries yield information relating to fine aspects of IPI. – initial pupil placement – gross pupil progress – sequencing and difficulty of instructional units – sequencing and difficulty of skills – test unreliability and non-validity	Modal placement levels for each grade was determined as follows: grade 1 level B grade 2 level C grade 3 levels C and D grade 4 level D grade 5 levels D and E grade 6 level E Percentages of pupils who could not be placed at any level decreased from grade 1 to 6. Over all grades the average number of units completed in one year was 12.5 (about one level). Average units completed in a year increased from grade 1 to 6. In all grades the level at which most work is done at the end of the year is one higher than at the beginning.

MATHEMATICS – FORMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Unks - (Continued)				Eighteen out of 70 units are identified as easy by pretest data; 26 are difficult. Most difficult skills are identified within the problem units by average test scores. Twenty-five units are identified as difficult by posttest data. Altogether 56 units are difficult by pretest and/or posttest data or need skills resequenced. Fourty-eight out of 372 skills are identified as easy by pretest data; 57 by CET data. Fourteen are difficult according to pretest data; 68 according to CET data; 32 by use of instructional techniques. For 55 units the orders of skills from easy to difficult according to pretest data are listed. Difficult units and skills are indicators of possible test non-validity or unreliability. Thirty-three units found easy by pretest data at the beginning of the year may indicate misplacement of pupils and non-validity of placement tests.

MATHEMATICS – FORMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Weiler & Weinberger - (RBS) - Degree of Implementation of IPI Mathematics: National Summary Report, Two Year Comparison - 1970	140 IPI schools 1,065 teachers	Placement profiles Prescription Sheets	Twice yearly, an analysis was made of the use of diagnostic instruments, mastery criterion and instructional materials and settings with a sample of ten pupils per class.	Placement tests 1968 - 69 88% 1969 - 70 78% correct usage Pre, Post and CETs 1968 - 69 72% - 96% 1969 - 70 89% - 96% correct usage. Increasing variability is used in instructional materials & settings. Schools having IPI in 1968 - 69 did better in 1969 - 70. After receiving the fall report, teachers improved their skills in implementing IPI. IPI can be successfully disseminated and replicated.
Weinberger - (RBS) - IPI Mathematics: A Report on the Results of 1968–1969 Prescription Data Analysis - 1969	1,200 pupils in 5 IPI schools	Prescription sheets	Prescription data for each skill in levels A - C and the number of curriculum-embedded tests and post-tests required to mastery were summarized.	Of the 122 skills in levels A - C: On 19 skills, 25% or more of the pupils required three or more CETs, thus indicating a difficult skill or a problem in the teaching materials or test. On 68 skills, 25% or more pupils required two or more post-tests, thus indicating a difficult skill or problem in the teaching materials or test.

MATHEMATICS – FORMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Weinberger - (RBS) - Temporal Retention - April 1969	4 IPI schools Grades 1-5 1,230 pupils	Placement tests	Analysis of units retained, gained, or lost during summer recess.	Mean units across levels and areas gained or lost was 0. Particular units by grade where mean loss or gain was greater than one level are noted. The recommendation is made that it is unnecessary to Placement Test pupils each fall.
Weinberger - (RBS) - Use of Data in Monitoring School School Implementation of IPI - Feb. 1969	79 IPI schools 650 teachers	Placement profiles Prescription sheets	Use of diagnostic instruments and mastery criterion. Use of instructional materials and settings.	Placement Tests 88% correct usage Pre-, Post-and CETs 72% to 96% correct usage More variability is needed in the use of the techniques. There is variability in length of the first prescription for a skill.
		Planning session report forms	Use of planning sessions.	Analyses include the nature and frequency of meetings with emphasis on the topics discussed and continuous training used.
		Report of student progress	Compiled from a data bank file of IPI placement and progress information on 15,000 students.	Used to determine the rate, amount and dispersion of academic progress made by individual (and groups of) students. There is wide dispersion within all IPI classes.
		Report of student visitation monitors	Results of periodic visits to the schools by trained observers.	Produces data on the elements involved in implementing IPI in various types of schools.

MATHEMATICS – FORMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Weinberger - (RBS) - Degree of Implementation of IPI: Spring Results April 1969	79 IPI schools 650 teachers	Prescription sheets	Use of diagnostic instruments and mastery criterion.	Pre-, Post-and CETs 85% to 96% correct usage. More variability is needed in the use of the techniques. There is variability in length of the first prescription for a skill.
Weinberger - (RBS) - Degree of Implementation of IPI: Fall-Spring Comparison April 1969	79 IPI schools 650 teachers	Prescription sheets	Use of diagnostic instruments and mastery criterion.	Correct usage of mastery criterion on CETs and posttests increased.
Weinberger - (RBS) - Report of Student Progress 1968 - 1969	15,000 pupils in grades 1-8 in 79 schools.	Machine scannable computer card	A computer data bank file was established in September containing IPI placement information. Up-dating of progress data occurred in November, February & May with pupil status reports generated in October, January, April and June.	Demonstration of the wide dispersion of pupils entering behavior in each mathematics area. Variation in the number of skills mastered across pupils between the four points in time. Difference in the number of skills mastered for any given pupil for two comparatively equal periods of time. Dispersion of pupils in the continuum at the time of the three progress up datings. Variability in skills mastered by grade level, by current level, and by area.

MATHEMATICS – FORMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Weinberger (RBS) - Curriculum Embedded Test Part II as a Predictor - December 1969	1,200 pupils in five IPI demonstration schools	Prescription sheets for levels B and C	To determine the value of CET Part II, percentages were calculated showing the correspondence between the score category of CET Part II: "High" (CET Part II score 85% or more) or "low" (CET Part II score 79% or less) and the category, of Part I for the succeeding skill.	CET Part II appears. – to contradict the pre-test scores more often by being "high" than "low". – to predict if the pupil's knowledge of a skill of the conflict is between a low pre-test and a high CET Part II score.
Weinberger (RBS) - Summary of IPI Planning Session Records - 1968-69, 1969	52 schools	Machine scannable form	Form completed by planning session leader and included questions on 1) Use of prepared agenda 2) Leadership of session 3) Topics discussed 4) Session attendance 5) Frequency of sessions 6) Length of sessions	Generally not. Primarily the coordinator with the principal and teacher second and third in utilization. Individual students in mathematics and summary information of pupil progress. Single grade level meeting together. Once a week. 16 - 45 minutes.

MATHEMATICS – FORMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Yeager, Lindvall - (LRDC) - An Exploratory Investigation of Selected Measures of Rate of Learning Winter 1967	Oakleaf pupils 1967-68	California Test of Mental Maturity (1st and 2nd grades) Otis Quick Scoring Test of Mental Ability (Grades 3-6)	Exploration of three possible measures of rate of learning that could be employed in individualized learning programs using IQ as a predictor of: 1) number of units completed per year; 2) time to complete given units; and 3) amount of content mastered per day.	There is no correlation between IQ and actual rate of progress in IPI, although there is a significant correlation for all grades between IQ and level of attainment prior to beginning IPI (as measured by Placement Testing). Correlation on the other two measures of rates of learning are generally non-significant, leading to the conclusion that rate of learning is not a general characteristic of the learner but rather is specific to the particular learning task.
Yeager, Lindvall - (LRDC) - Evaluation an Instructional Innovation through the Observation of Pupil Activities - 1968	Oakleaf, one other IPI school	Structured Observation Guide	Observers observed, at two-minute intervals over entire class period, and made a tally for each student, showing the specific activities in which he was engaged.	Major Category of Activity / Mean% of Students Engaged in Activity: Oakleaf / Other — Independent 61% / 42%; Teacher-pupil 8% / 12%; Non-instructional 29% / 42%; Pupil-pupil 2% / .2%; Group .0% / .0%

MATHEMATICS – SUMMATIVE

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Bialeck and Castro- A Second Year Evaluation of Individually Prescribed Instruction (IPI). Monterey, California, Nov. 1968.	Grades 4-6 in three IPI and three control schools in Monterey area.	Bialeck-made paper and pencil questionnaire.	The percentage of responses by item is reported by school.	IPI pupils choose arithmetic as one of their two favorite subjects more than control pupils. Low ability students find IPI most attractive. More IPI pupils believe they are 'learning about as much as I can right now' than control pupils. In other words, pupils do recognize this feature in IPI. IPI pupils refer working by themselves more than control pupils.
	Three IPI and three control schools in Monterey area.	Bialeck-made observation schedule of pupil activities.	A random selection of 10 pupils per class was observed three or four times a period for one minute of observation for five days. On this basis, a description of the activities was made.	Given that the IPI program was not strictly implemented in these schools, the results were: – There is as much variability within the IPI and control school groups as there is between them. – A 'typical' child spends his time:

	IPI	Control
independent work	42%	36%
teacher-pupil work	6%	8%
non-instructional use of time	47%	25%
pupil-pupil activity	4%	9%
large group activity	1%	22%

MATHEMATICS – SUMMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Bialeck and Castro (Continued)		Bialeck-made observation of teacher-student interaction.	A two-week observation of IPI and control classes for a total of five hours.	Student-oriented communication 63% 34% non-instructional interation 70% 43%
	Grades 4-6 in three IPI and three control schools in Monterey area.	Iowa Test of Basic Skills	Test was administered in September and May and a 'total arithmetic score' consisting of a combination of the concepts and problem solving was computed.	There is no significant difference betwene IPI and control; all differences are insignificant or favor the non-IPI groups.
		Placement tests	Tests were administered in September incorrectly and in May. The Lorge-Thorndike Intelligence Scale was used to divide the pupils into three ability groupings.	General superiority of non-IPI. All differences are insignificant or favor the non-IPI groups.
Elk Grove Illinois School District with the cooperation of Dr. Robert Stake, - Individually Prescribed Instruction: A Study of Independent Behavior. Feb. 1968.	Gifted pupils (+120 IQ) in two schools in Elk Grove, Illinois school district and two control schools. All pupils in two IPI and two control schools Parents of pupils	An independence scale was developed from the results of a teachers' survey. An attitude questionnaire was developed regarding math in general and IPI math. Questionnaire for parents regarding the IPI program.	Instruments were administered during the fall of 1967.	Gifted IPI students demonstrate more independent positive actions than gifted non-IPI students. IPI students indicate slightly more positive attitudes toward reading and math than do non-IPI children. IPI students showed more favorable attitudes toward IPI math than general math. Parents of children in IPI generally have positive attitudes toward the program.

MATHEMATICS – SUMMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Fisher - (LRDC) - An Investigation of Three Approaches to the Teaching of Mathematics in the Elementary School - 1967.	420 pupils in five schools with three types of curriculum treatment: – IPI – programmed learning instruction – standard classroom instruction	Metropolitan Achievement Test: arithmetic computation and arithmetic problem-solving and concepts. Iowa Test of Basic Skills (ITBS): arithmetic concepts and arithmetic problem solving.	Instruments: The Metropolitan was used as pretest and posttest of student's arithmetic ability with pre-administration the preceding spring. The ITBS was administered on an untimed-ungraded basis as a posttest. The Otis Quick-Scoring Mental Ability Test was used as a control variable.	No significant differences between IPI, programmed learning instruction, and standard classroom instruction.
Gallagher - The Evaluation of Student Achievement in the Individually Prescribed Program in Mathematics at the Frank A. Berry School, Bethel, Conn. - May 1968.	Grades 3-6 in school in Conn. - half of the pupils in IPI and half not.	California Test of Personality: sections on self-reliance, personal worth and school relationships.	Mean difference between IPI and control were computed.	Slightly higher scores for control over IPI.
		Gallagher-made attitude toward arithmetic instrument.	Mean difference between IPI and control were computed.	Significant difference in favor of IPI pupils.
		Stanford Achievement Test.	The test was administered in October 1967 and April 1968 to both groups in computation, concepts and applications. Analysis of variance procedures were applied to median scores (grade equivalents).	No significant difference.

MATHEMATICS – SUMMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Hestwood - Individually Prescribed Instruction - Hall School, Minneapolis, Minnesota - 1970	40 IPI 6th grade pupils in one school. 112 non-IPI 6th grade pupils in three schools.	Iowa Test of Basic Skills - Modern Mathematics Supplement	Pre-test was administered in September 1969 to all pupils with the post-test given in mid-May 1970. All pupils are in target area elementary schools.	Hall School tied for the lowest median raw score on the pre-test but on the post-test was tied for the highest median raw score. In terms of grade equivalents, Hall made a gain of over one year, while the other three schools made only half that gain.
Hoeltke & Gilchrist - An Evaluation of the Educational Program of Pawnee School - School District 110, 1969	150 randomly selected IPI pupils and 150 matched control pupils in grades 2-6	Stanford Achievement Test	Difference scores over one school year were used as the criterion scores for analysis of variance.	No significant difference between IPI and control pupils in grades 2-5. In grade 6, control pupils scored significantly higher in arithmetic concepts.
	150 randomly selected IPI pupils	Iowa Test of Basic Skills	Results were evaluated against expected results as reported in the test manual.	Thrid grade students scored significantly (.05 level) above grade expectation on problem solving. Grade 4 and 5 pupils were significantly below grade expectation in Fundamental Operations and grade 6 pupils were below in one arithmetic subtest.
	150 IPI pupils	Self Concept As A Learner Scale (SCALS)	Difference in self concepts between IPI pupils and elementary school children in general were compared using the t test for analysis of sample values against a population parameter.	Students hold a positive self concept as learners (mean of 34.35 out of a possible 40).

MATHEMATICS – SUMMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Independent School District, 273 IPI Evaluation-Highlands Elementary School - 1970	325 IPI pupils in grades 4-6 and matched control group.	Iowa Test of Basic Skills	Complete battery including the Modern Math Supplement was administered to all pupils.	Although both IPI and control group showed some overall improvement, the control group showed the greater improvement.
Lewy - Individually Prescribed Instruction and Academic Achievement. A Report on an Experimental Project. March 1969	141 IPI and 198 non-IPI pupils in 4th and 5th grades.	Iowa Test of Basic Skills IPI mathematics test	IPI pupils had been in the program for two years. Data analysis on 53 variables divided students into grades, sex, schools and IQ levels.	No significant differences between groups was established.
RBS - IPI Evaluation Summary 1967-68: Status Report Nov. 1968	107 teachers in five paired IPI and control schools	Flanders-Interaction Analysis	The Mann-Whitney U-Test was used to perform the statistical analysis in which the data were compared, variable by variable. The analysis was made combining grades 1-3, 4-6, and 1-6.	Questioning—Control school teachers asked more questions than IPI teachers – significant difference. Criticism—IPI teachers were more critical of students in grades 1-3 than control teachers—significant difference. Silence—The amount of 'silence' was statistically significant in grades 1-3, with the IPI, schools being more 'silent.'

MATHEMATICS – SUMMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
RBS - (Continued)				Student Talk– There were slight, but statistically significant differences in both categories of student talk (narrow and broad). Students used more broad and less student talk in the IPI classrooms than students in control classes. No significant differences between IPI and control in socio-emotional climate, evaluative behaviors, and lecturing and directions.
96	Grades 3-6 in five paired IPI and control schools- 1,700 students	Iowa Test of Basic Skills	This instrument was administered in the fall of 1967 and spring of 1968 in arithmetic concepts and problem solving, on an ungraded-untimed basis. The sections on reading comprehension and vocabulary were also given. The total raw score from 'test grades' 3, 5, and 7 were analyzed using MANOVA.	No statistically significant difference between IPI and control schools in math achievement. Girls did better than boys. No statistically significant difference between IPI and control schools in the dispersion of math achievement scores.
		IPI Placement tests	The IPI placement tests were administered in the fall of 1967 and the spring of 1968. MANOVA processing was used.	IPI schools started lower in three of four grades, gained more, and ended higher than control schools for all four grades. A significant difference in the dispersion of placement scores, greater than .01, occured in the IPI schools both pre- and post.

MATHEMATICS – SUMMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
RBS - (Continued)		An arithmetic reasoning test which is part of the National Longitudinal Study of Mathematics Abilities.	A fifteen-item multiple-choice test consisting of math problems for which student responded with process to be used.	Extreme non-normality (skewed to the high end – upper limit too low) of the untimed scores led to no processing.
		The Ideas and Preferences Inventory and Arithmetic Reasoning sections of the attitude measures used by the National Longitudinal Study of Mathematics Abilities.	The following scales were submitted for MANOVA processing: arithmetic vs. non-arithmetic pro-arithmetic composite arithmetic–easy vs. hard actual arithmetic self-concept ideal arithmetic self-concept.	No statistically significant differences between the IPI schools and the control schools were found. There was considerable interaction between school and treatment.
Research for Better Schools, Inc. - Data Comparison Demonstration-Control School Pair #1 - Sept. 1969	Grades 4-6 80 IPI and 100 control pupils	Pupil opinionnaire	Three open - ended stems were analyzed for ten students from each class.	IPI pupils have a more positive attitude toward school in general and toward the subject of mathematics in particular.
	Grades 4-6 230 IPI and 240 control pupils	Iowa Test of Basic Skills	Arithmetic concepts and problem solving were administratered in the spring of 1969. Grade means were compared.	No differences between IPI and control pupils.
		IPI Mathematics Placement Test	Tests were administered in the spring of 1969 and percentile placements in each area were compared.	IPI pupils scored as high or higher than control pupils.

MATHEMATICS – SUMMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Research for Better Schools, Inc. - Demonstration - Control School Pair #2 - Sept. 1969	Grades 4-6 90 IPI and 20 control pupil pupils	Pupil opinionnaire	Three open - ended stems were analyzed for ten students from each class.	IPI pupils have a more positive attitude toward school in general and toward the subject of mathematics in particular.
	Grades 4-6 270 IPI and 248 control pupils	Iowa Test of Basic Skills	Arithmetic concepts and problem solving were administratered in the spring of 1969. Grade means were compared.	IPI pupils scored as high or higher than control pupils on both measures.
		IPI Mathematics Placement Test	Tests were administered in the spring of 1969 and percentile placements in each area were compared.	
Research for Better Schools, Inc. - Data Comparison Demonstration-Control School Pair #3 - Sept. 1969	Grades 4-6 60 IPI and 60 control pupils	Pupil opinionnaire	Three open - ended stems were analyzed for ten students from each class.	IPI pupils have quite a positive attitude toward math; however, there is a decrease in "generally positive attitude" toward school from 75% in fourth grade to 40% in sixth; in contrast control pupils showed an increase in this dimension from 60% in fourth grade to 90% in sixth.

MATHEMATICS – SUMMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
RBS - (Continued)	Grades 4-6 170 IPI and 150 control pupils	Iowa Test of Basic Skills	Arithmetic concepts and problem solving were administratered in the spring of 1969. Grade means were compared.	IPI pupils scored higher on IPI placement tests. Control pupils scored higher on Iowa Tests of Basic Skills.
		IPI Mathematics Placement Test	Tests were administered in the spring of 1969 and percentile placements in each area were compared.	
Research for Better Schools, Inc. - Data Comparison Demonstration-Control School Pair #4 - Sept. 1969	Grades 4-6 70 IPI pupils 100 control	Pupil opinionnaire	Three open - ended stems were analyzed for ten students from each class.	IPI pupil attitudes are more positive than control student attitudes.
	Grade 4 100 IPI and 110 control pupils	Iowa Test of Basic Skills	Arithmetic concepts and problem solving were administratered in the spring of 1969. Grade means were compared.	On Lorge-Thorndike Intelligence Test, there was a significant difference in favor of the control pupils. This difference was shown by the control pupils scoring higher on these instruments.
		IPI Mathematics Placement Test	Tests were administered in the spring of 1969 and percentile placements in each area were compared.	
Research for Better Schools, Inc. - Data Comparison Demonstration-Control School Pari #5 - Sept. 1969	Grade 4 40 IPI and 40 control pupils	Pupil Opinionnaire	Three open - ended items were analyzed for ten students from each class.	IPI pupils have a more positive attitude toward school in general and toward the subject of mathematics in particular.

MATHEMATICS – SUMMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
RBS - (Continued)	Grades 4-6 170 IPI pupils 250 control pupils	Iowa Test of Basic Skills	Arithmetic concepts and problem solving were administratered in the spring of 1969. Grade means were compared.	IPI pupils scored higher than control pupils.
		IPI Mathematics Placement Test	Tests were administered in the spring of 1969 and percentile placements in each area were compared.	IPI pupils scored higher than control pupils.
Sandvick - An Evaluation of IPI (Math) Procedures, Carmen School, 1968-1970, Waukegan School District 61, Illinois 1970	265 IPI pupils in six chronological age groups and a comparative control group.	Stanford Achievement Test	Scores for Arithmetic Computation, Arithmetic Concepts, and Arithmetic Applications for October 1968 and March 1970 were used. Two sets of scores were compared for gains or losses within each age-level group within both control and experimental groups according to mean, median, and range.	For the elementary groups, the control pupils in general demonstrated greater gains than the IPI pupils.
	29 7th graders who had IPI as 6th graders & 29 control pupils			For the junior high pupils, the results are mixed with more IPI pupil gains than control pupil gains.
	265 IPI pupils in six chronological age groups and a comparative control group.	Questionnaire	Instrument included open-ended and multiple choice items.	Elementary school pupils like school. The majority choose math as their favorite subject. IPI apparently enhances the self-concept of the child, as 59% of IPI pupils see themselves as above average or top students compared wtih 24% of control pupils. Greater number of non-IPI pupils (87%) like school than do the IPI group (78%).

MATHEMATICS – SUMMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Weiler (RBS) – School Comparison 1 – Fall 1970	310 IPI pupils and 350 Control pupils in grades 3-6.	Iowa Test of Basic Skills: Arithmetic Concepts and Problem Solving. IPI Mathematics Placement Tests.	The instrument was administered in spring 1970. Results are reported as mean grade equivalents. The placements were compiled by area for each grade. The 25th, 50th, and 75th percentiles were determined and a comparison was made to determine if these points in the distribution fell at the same or at different levels.	On the arithmetic subjects, IPI pupils have a lower mean achievement than control pupils. IPI pupils were equal to or higher than non-IPI pupils.
Weiler (RBS) – School Comparison 2 – Fall 1970	320 IPI pupils and 260 Control pupils in grades 3-6.	Iowa Test of Basic Skills: Arithmetic Concepts and Problem Solving. IPI Mathematics Placement Tests.	The instrument was administered in spring 1970. Results are reported as mean grade equivalents. The placements were compiled by area for each grade. The 25th, 50th, and 75th percentiles were determined and a comparison was made to determine if these points in the distribution fell at the same or at different levels.	The IPI pupils earned mean grade equivalent scores equal to or higher than the non-IPI pupils in five of the eight cases on the mathematics subtest. The IPI pupils scored higher than the non-IPI pupils.
Weiler (RBS) – School Comparison 3 – Fall 1970	200 IPI pupils and 250 Control pupils in grades 3-6.	Iowa Test of Basic Skills: Arithmetic Concepts and Problem Solving.	The instrument was administered in spring 1970. Results are reported as mean grade equivalents.	The IPI pupils were lower in mean grade equivalent achievement than the non-IPI pupils.

MATHEMATICS – SUMMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Weiler (RBS) - (Continued)		IPI Mathematics Placement Tests.	The placements were compiled by area for each grade. The 25th, 50th, and 75th percentiles were determined and a comparison was made to determine if these points in the distribution fell at the same or at different levels.	The IPI pupils were equal to or higher than the Control pupils 97% of the time.
Weiler (RBS) – School Comparison 4 – Fall 1970	180 IPI pupils and 230 Control pupils in grades 3 and 4.	Iowa Test of Basic Skills: Arithmetic Concepts and Problem Solving.	The instrument was administered in spring 1970. Results are reported as mean grade equivalents.	The achievement of IPI pupils is lower than the achievement of Control pupils in all cases.
		IPI Mathematics Placement Tests.	The placements were compiled by area for each grade. The 25th, 50th, and 75th percentiles were determined and a comparison was made to determine if these points in the distribution fell at the same or at different levels.	The IPI pupils were equal to or higher than the non-IPI pupils in 97% of the comparisons. (On the Lorge-Thorndike Intelligence Tests, the mean group IQ is more than 7 points lower for the IPI school than the control school.
Weiler (RBS) – School Comparison 5 – Fall 1970	230 IPI pupils and 350 Control pupils in grades 3-6.	Iowa Test of Basic Skills: Arithmetic Concepts and Problem Solving.	The instrument was administered in spring 1970. Results are reported as mean grade equivalents.	On the arithmetic subtests, the IPI pupils in grades 3, 5, and 6 scored equal to or higher than the non-IPI pupils and in grade four earned a mean grade equivalent scores of one and two months lower than the non-IPI pupils.

MATHEMATICS – SUMMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Weiler (RBS) - (Continued)		IPI Mathematics Placement Tests.	The placements were compiled by area for each grade. The 25th, 50th,. and 75th percentiles were determined and a comparison was made to determine if these points in the distribution fell at the same or at different levels.	The IPI pupils were equal to or higher than the non-IPI pupils in achievement.
Weiler (RBS) – School Comparison 6 – Fall 1970	250 IPI pupils and 330 Control pupils in grades 3-6.	Iowa Test of Basic Skills: Arithmetic Concepts and Problem Solving.	The instrument was administered in spring 1970. Results are reported as mean grade equivalents.	The IPI and non-IPI pupils achieved at about the same level.
		IPI Mathematics Placement Tests.	The placements were compiled by area for each grade. The 25th, 50th, and 75th percentiles were determined and a comparison was made to determine if these points in the distribution fell at the same or at different levels.	The IPI pupils were equal to or superior to the non-IPI pupils in 91% of the comparisons.
Weinberger - (RBS) Comparison of Downey (IPI) & Hamilton (Control) August 1969.	Grade 4-6 61 IPI & 61 control pupils	Lorge Thorndike Intelligence Test IPI Placement Test Iowa Test of Basic Skills: Arithmetic Concepts and Problem Solving.	Pupils in this study consist of a sample of pupils with an above average IQ and a below average IQ as measured by the Lorge Thorndike Intelligence Test.	On IPI placement tests, significant difference in favor of IPI for grades 4-6 pupils in high and low IQ groups. On Iowa Test of Basic Skills, no significant differences between IPI and control.

MATHEMATICS – SUMMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Weinberger - (RBS) - Summary of Achievement Study Comparing Individually Prescribed Instruction with Traditional Methods 1967-1969, 1969	Grades 4-6 in five paired IPI and control schools 1,000 students	Iowa Test of Basic Skills	This instrument was administered in the spring of 1969 in Arithmetic Concepts and Problem Solving on an ungraded untimed basis. The grade level of each group of students was computed and analyzed using analysis of variance.	No statistically significant difference between IPI and control schools in math achievement.
		IPI Placement Tests	The IPI Placement Tests were administered in the spring of 1969. The spring results were compared by examining the 25th, 50th, and 75th percentiles in each of the twelve mathematics areas and determining if the levels achieved by the IPI peoples was higher than, the same as, or lower than that of control pupils.	The differences between IPI and control pupils across all grades, school districts and the three percentiles demonstrate that – IPI pupils achieved one or more levels higher than the control pupils 40% of the time. – IPI pupils achieved at the level as control pupils 56% of the time. – IPI pupils achieved one or more levels lower than control pupils 4% of the time.
Weinberger & Scharf - (RBS) - Pupil Opinionnaire: "What Do You Think?" 1969	914 pupils in grades 4, 5, and 6, in five IPI demonstration-development schools. 989 pupils in grades 4, 5, and 6, in five control schools.	"What Do You Think?"	Instrument asked questions about attitudes toward school and specific subjects using three techniques: 1) semantic - differential technique	IPI has an effect on pupil's attitudes toward the math program and to the school experience as a whole.

MATHEMATICS – SUMMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Weinberger & Scharf (Continued)			2) open-ended questions	IPI seems to have positive effect on the attitudes of the students, both toward the specific subject of mathematics and toward school in general.
			3) multiple-choice items	IPI sixth grade students give more positive responses on the subject of mathematics than control sixth-grade pupils.

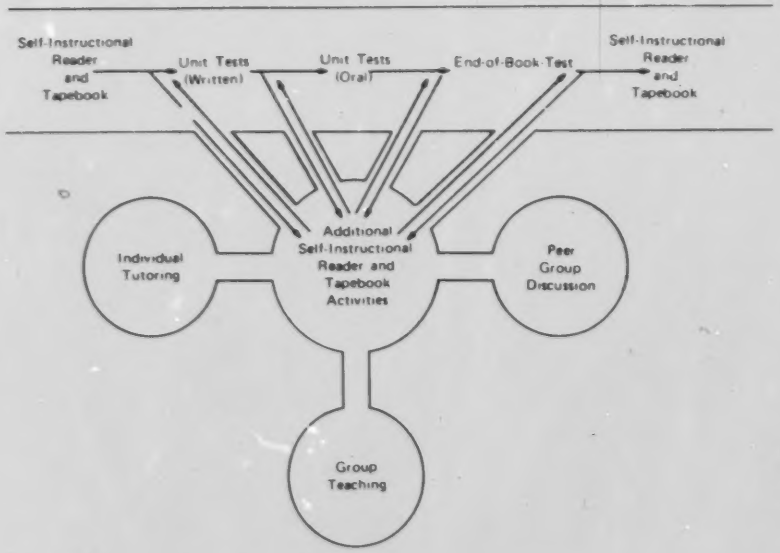
READING

READING

The reading curriculum has been developed by sequencing the specific reading skills that need to be mastered by each pupil. The first three stages of the reading program are built around programmed tests developed by a commercial publisher. This material is supplemented by special worksheets and record-like discs which are prepared by the R & D center at the University of Pittsburgh. In addition to Directed and Independent Reading Activities, the fourth stage is also concerned with the maintenance, reinforcement and improvement skills.

The diagrams below illustrate the sequence of materials and activities for these stages:

STAGES 1 – 3



STAGE 4

SKILLS \ LEVELS	A*	B*	C*	D*	E	F	G	H	I	J	K	TOTALS E–K
Visual Discrimination	12	X										12
Auditory Discrimination	6	2	X									
Structural Analysis	X	X	4	7	5	6	4	4	3	4	4	30
Vocabulary Development	X	4	4	4	3	2	2	2	2	2	2	15
Literal Comprehension	5	4	4	3	3	3	4	3	3	4	3	23
Interpretive Comprehension	5	8	5	5	5	4	5	5	4	4	3	30
Evaluative Comprehension	2	3	4	2	2	3	4	3	4	4	4	24
Library Skills	3	2	3	2	2	3	4	4	4	2	X	19
Reference Skills	X	4	1	3	7	5	5	2	4	3	2	18
Organizational Skills	X	X	X	X	X	4	3	2	2	4	3	18
Related Reading	6	3	1	X								10
TOTALS	39	30	26	26	27	30	31	25	26	27	21	308

*This portion of the skills continuum is an integral part of the first three stages of IPI Reading.

READING – FORMATIVE

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Buccino (RBS) - Reading Diagnostic Instruments – July 1970	1,043 pupils in grades 1-6 from six IPI demonstration - development schools.	Placement profiles Reading prescription sheets	The consistency between placement test scores and pretests scores was analyzed.	Placement test scores and pretest scores are consistent.
Weiler, et. al. (RBS) - Classification of Standard Teaching Sequence (STS) Pages - July 1970	IPI Reading teachers	Questionnaire	Teachers classified skill sheets from the reading sequence.	Pages were classified into the categories of review, instructional, practice and test. For each skill, an index of agreement was computed. The skills with a low degree of agreement are being scrutinized to determine the reason for lack of agreement so that appropriate editional changes can be made.
Weiler and DeRenzis (RBS) - Readability Levels of E Level Reading Skill Sheets - April 1970	IPI Reading materials	Fry Readability Formula	The readability level was computed for the skill sheets, CETs and supplementary materials for Level E.	A variation in readability levels existed from Grade 1 to 9 with up to differences of five grade levels between directions and text for some skills.
Weiler and DeRenzis (RBS) - Reading Oral Test Study - 1969	596 pupils in Programmed Readers 1-8	Study program Reader Tests	Errors made on the tests were tabulated.	Pupils demonstrate increased facility in decoding skills as they progress through the units. For books 1 - 8 additional strategies need to be available for the teachers.

READING – SUMMATIVE

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Bialeck and Castro - A Second Year Evaluation of Individually Prescribed Instruction (IPI). Monterey, California, Nov. 1968.	Grades 4-6 in one IPI and one control school in Monterey area.	Bialeck-made paper and pencil questionnaire.	The percentage of response by item is reported by school.	Control pupils choose reading as one of their two favorite subjects more than IPI pupils.
Elk Grove Illinois School District with the cooperation of Dr. Robert Stake – Individually Prescribed Instruction: A Study of Independent Behavior – Feb. 1968.	Gifted pupils (+ 120 IQ) in two schools in Elk Grove, Illinois school district and two control schools. All pupils in two IPI and two control schools Parents of pupils	Attitude Questionnaire	The questionnaire was developed regarding reading in general and IPI reading.	IPI students indicate slightly more positive attitudes toward reading than do non-IPI children. IPI students showed more favorable attitudes toward IPI reading than general reading.
Lewy - Individually Prescribed Instruction and Academic Achievement. A report on an Experimental Project. March 1969	141 IPI and 198 non-IPI pupils in 4th and 5th grades.	Free writing sample IPI language test	IPI pupils had been in the program for two years. Data analysis on 53 variables divided students into grades, sex, schools,and IQ levels.	No significant differences between groups was established in the areas.
Weiler (RBS) - School Comparison 1 – Fall 1970	310 IPI pupils and 350 Control pupils in grades 3-6.	Iowa Test of Basic Skills Vocabulary and Reading Comprehension.	The instrument was administered in spring 1970. Results are reported as mean grade equivalents.	On the reading subtests, IPI pupils earned mean grade equivalent scores lower than non-IPI pupils in grades 3, 4, 5 and higher in grade 6.

READING – SUMMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Weiler (RBS) – School Comparison 2 – Fall 1970	320 IPI pupils and 260 Control pupils in grades 3-6.	Iowa Test of Basic Skills Vocabulary and Reading Comprehension.	The instrument was administered in spring 1970. Results are reported as mean grade equivalents.	The IPI pupils earned mean grade equivalent scores equal to or higher than the non-IPI pupils in half the cases on the reading subtests.
Weiler (RBS) – School Comparison 3 – Fall 1970	200 IPI pupils and 250 Control pupils in grades 3-6.	Iowa Test of Basic Skills Vocabulary and Reading Comprehension.	The instrument was administered in spring 1970. Results are reported as mean grade equivalents.	The IPI pupils were lower in mean grade equivalent achievement than the non-IPI pupils. The IPI pupils were equal to of higher than the Control pupils 97% of the time.
Weiler (RBS) – School Comparison 4 – Fall 1970	180 IPI pupils and 230 Control pupils in grades 3 and 4.	Iowa Test of Basic Skills Vocabulary and Reading Comprehension.	The instrument was administered in spring 1970. Results are reported as mean grade equivalents.	The achievement of IPI pupils is lower than the achievement of Control pupils in all cases. The IPI pupils were equal to or higher than the non-IPI pupils in 97% of the comparisons. (On the Lorge-Thorndike Intelligence Tests, the mean group IQ is more than 7 points lower for the IPI school than the control school.)
Weiler (RBS) – School Comparison 5 – Fall 1970	230 IPI pupils and 350 Control pupils in grades 3-6.	Iows Test of Basic Skills Vocabulary and Reading Comprehension.	The instrument was administered in spring 1970. Results are reported as mean grade equivalents.	On the reading subtests, the IPI pupils earned mean grade equivalent scores equal to or higher than the non-IPI pupils in all cases.

READING – SUMMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Weiler (RBS – School Comparison 6 – Fall 1970	250 IPI pupils and 330 Control pupils in grades 3-6.	Iowa Test of Basic Skills Vocabulary and Reading Comprehension.	The instrument was administered in spring 1970. Results are reported as mean grade equivalents.	The IPI and non-IPI pupils achieved at about the same level. The IPI pupils were equal to or superior to the non-IPI pupils in 91% of the comparisons.
Weiler – Difficulty and Readability Level Directed Reading Selections	Six IPI demonstration-development schools	Pupil and teacher questionnaires	Determination of the pupil's and teacher's perceptions of difficulty of the reading selections was compared with the readability level of each selection as computed by the formula.	In Progress
Weiler – Reading Skills Analysis	1,500 pupils Grades 3-6 Six IPI demonstration-development schools	IPI reading prescription sheets	Prescription and test scores were analyzed to illustrate pages prescribed and pupil mastery of skills.	In Progress

HANDWRITING

HANDWRITING

The IPI Handwriting Program has been designed to have children acquire an individual and legible style of writing by providing an instructional system that will allow each child to learn at this instructional level, learn at his own rate and work only on those skills in which he cannot demonstrate mastery.

PHASES

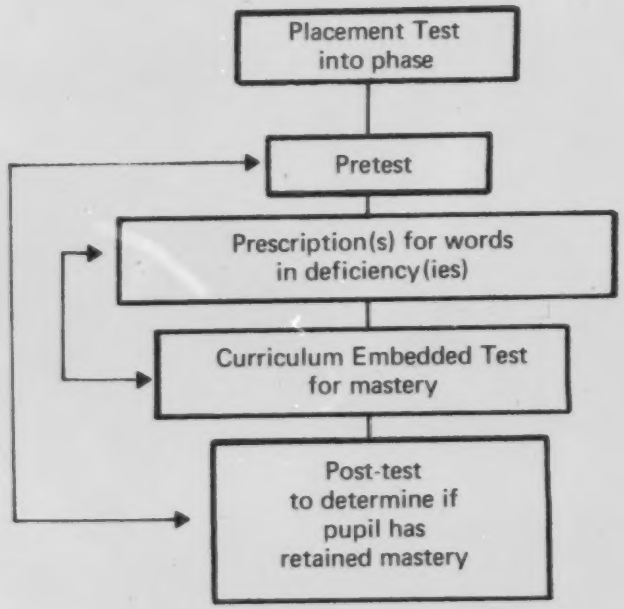
Manuscript — Child moves from a non-printer to a legible printer in eight units.

Transition — Behaviors of making cursive letters is presented in these units.

Cursive — Child refines his skill of cursive writing and becomes actually involved in the evaluative aspects of handwriting in five units.

Application — Practical settings of manuscript and cursive writing skills are used in three units.

PROCEDURES


Placement Test into phase
Pretest
Prescription(s) for words in deficiency(ies)
Curriculum Embedded Test for mastery
Post-test to determine if pupil has retained mastery

HANDWRITING

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Unks - (RBS) - Pilot Study of IPI Handwriting Prescription Data - June 1970	Sample from 2,500 pupils, grades 1-6. Six IPI demonstration-development schools.	IPI Handwriting prescription sheets	Study of mastered prescriptions to determine pupil progress and variation in amount and kind of progress pupils make.	Moderate to high negative correlations between gain scores and pretest scores indicating that skills where pupils scored lowest on the pre-test left the mast room for gain or improvement. Correlations between gain and pages used were low. 43 out of 89 objectives in all 8 books were possible difficult or problem skills.
Unks - (RBS) - Report on IPI Handwriting Placement Test Analysis - February 1970	Sample from 2,500 pupils, grades 1-6. Six IPI demonstration-development schools.	IPI Handwriting placement tests	The nine placement tests were administered. Data was collected and analyzed by grade.	Descriptive statistics and item analyses for each test identify the skills to which curriculum developers want to give special attention. Modal book placements for each grade were determined as follows grade 1 Readiness book and Book 1 grade 2 Book 2 manuscript grade 3 Book 3 manuscript-cursive grade 4 Book 4 grade 5 Book 4 grade 6 Book 5 and 6
Unks- (RBS) - Pupil Progress and Skill Analysis in IPI Handwriting 1969 - 1970	2,400 pupils Grades 1-6. Six IPI demonstration-development schools	IPI handwriting prescription sheets	Pupils progress during the year was monitored. The degree to which proper procedures were implemented by the teachers was analyzed.	In Progress

SPELLING

SPELLING

The IPI Spelling Program provides a framework in which a child can learn to spell those words he needs currently in written expressions, as well as those words he needs most frequently as an adult.

Three Major Phases

1 Spelling decoded with decoding part of reading program.

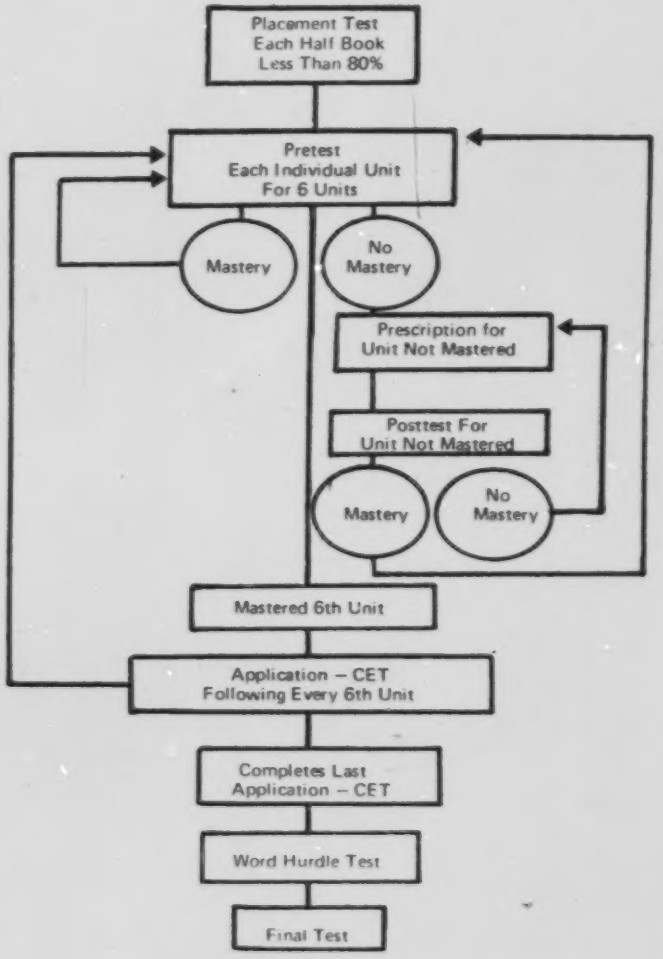
2 Spelling generalizations and practice words.

3 Expansion of Phase 2 concentrating on word usage and vocabulary.

In each of these phases the skills of listing, following directions, discussion-making, self-reliance and hand-writing are stressed.

As spelling currently operates, the materials of a standardized program are used with correlated diagnostic instruments which are on cassette tapes.

Flow Chart



SPELLING

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Schmidt (RBS) - Relationship of Rhythmic Ability to Spelling Achievement: Report of a Pilot Study at McAnnulty School - 1970	324 pupils. Grades 3 - 6 One IPI Demonstration-development school	Lorge Thorndike Intelligence Test Seashore Measures of Musical Talents: Rhythm Test IPI Spelling Tests	Differences between "high" and "low" spelling groups on rhythm IQ and types of spelling areas were studied.	IQ was significantly higher for high achievers in spelling than for low achievers in spelling. High ability to perceive, recall and recognize rhythmic patterns was found more often among high achievers than low achievers in spelling; and low ability to perceive, recall and recognize rhythmic patterns was found more often among low spelling achievers than high ones. Ability to perceive, recall and recognize rhythmic patterns were not significantly correlated with IQ. Errors made in spelling by high achievers did not differ in kind significantly from those made by low achievers.
Unks (RBS) - Degree of Implementation of IPI Spelling: Demonstration Schools Summary - May 1970	57 teachers Six IPI Demonstration-development schools	Placement profiles IPI Spelling prescription sheets	Use of diagnostic instruments and mastery criterion. Use of instructional materials	Placement tests: 89% correct usage. Pre-post, final and retention tests: 83 to 99% correct usage. Variation in activities prescribed existed in each track of the curriculum.
Unks (RBS) - Study of IPI Spelling Prescription Data - July 1970	Grades 3 - 6 Sample of 10 pupils per class. Six demonstration-development schools	IPI Spelling prescription sheets	Comparison was made between pupils in the single unit and sixth unit track's.	Spelling program was generally easy for pupils in both tracks, and both groups mastered similar amounts of material.

SCIENCE

IPI SCIENCE

The IPI Science program emphasizes both the content and processes of science via learning tasks which are correlated with a series of specified objectives. The present program consists of Levels A and B designed for grades K-1, with a plan for a total K-12 program. Within Levels A & B, the content includes natural environment, physical states, properties of matter, forces, symmetry, time and temperature. The processes of observing, comparing, ordering, classifying, measuring, inferring and predicting are presented.

As an instructional system, IPI Science consists of:

1. *Diagnostic and evaluative instruments* that locate students on a learning continuum in various scientific areas, and
2. A *management system* that allows teachers to proscribe materials and settings for each student
3. A *training program* that provides the skills necessary for administrators, teachers, and aides to function within the system
4. *Instruction materials* consisting of equipment kits, audio piece, visual components, and paper-pencil devices – all designed around specific objectives
5. *Various activities* including taped lessons, group discussions, games, puzzles, projects, and self-initiated independent activities
6. A *monitoring and feedback* network designed to improve the instructional system

PURPOSES AND ACTIVITIES IN IPI SCIENCE

PURPOSE	ACTIVITY
1. To provide opportunity for self-paced learning of prescribed process skills within certain concept arees.	Student listens to and reponds individually to a learning task manipulating a variety of materials in a science kit. (Taped activity for non-readers.)
2. To provide for socialization, verbatization, relationship of science activities to daily life, and promotion of the atmosphere of inquiry.	Teacher directed or student directed small group activity prescribed for a number of individuals who cluster around a given unit. (Teacher kits available for group leader's use.)
3. To encourage the child to explore further a unit in which he is engaged and interested; or to provide remedial activities for a child who may be having difficulty with any unit.	Teacher guided independent or small group activity either teacher prescribed or student initiated. (Alternative materials kits and other resources available for teacher or student use.)
4. To emphesize investigation through experimentation.	An independent self-initiated activity for a child who wishes to explore a given idea in depth. (Resource material available for student use.)

SCIENCE – FORMATIVE

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Appel and Stolte (RBS) - Assessment of Existing Elementary Science Programs - 1970	Seven existing programs	Checklist of 25 items	Each program was rated on its curriculum, instruction and practical aspects on a scale of 0 = no attempt to 3 = definite attempt and achievement	The Science Curriculum Improvement Study (SCIS) received the highest rating due to its organization, science concepts developed, sequence of these concepts and scope of the science.
Unks (RBS) - Review of IPI Science Prescriptions - 1970	282 Prescriptions Grades 1-2 Three IPI demonstration-development schools	IPI Science prescription sheets	Review of form to investigate use of management tools.	Teachers and aides correctly used the prescription form to record a pupil's activities in sequence and clearly indicate his progress or lack of it through a unit.
Unks (RBS) - IPI Science Results of Item Analyses of Supplementary Tests - 1970	859 pupils, grades 1-2. Six IPI demonstration - development schools	Inventory of Prerequisite Skills Auditory Prescription Test Short Vowel Embedded Sound Test	Instruments were administered to measure the pupils' entering behavior and to evaluate its effect on performance in IPI science.	Inventory of Prerequisite Skills and Auditory Perception Tests were easy for first and second grade pupils. Most pupils were ready for the science program. This instrument was difficult for first graders, and too long, showing a fatigue effect on the pupils.
Unks (RBS) - Summary of Observations on IPI Science in Demonstration Schools - June 1970	Grades 1-2. Five IPI demonstration-development schools	Observation Checklist	Casual and subjective observations were used accompanied by a checklist. Evaluation of program using observations was investigated.	Since IPI science is not primarily a paper and pencil program, continued observations appears to be a profitable way to evaluate the program. The checklist used may be more formalized so as to be used more objectively.

SCIENCE – FORMATIVE (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Unks - (RBS) - IPI Science Case Studies: Initial Inputs to a Longitudinal Investigation	72 pupils Grades 1 - 2 Six IPI demonstration-development schools	School permanent record Test scores IPI Science prescriptions	Information was collected beginning school year 1969-1970 and will continue in 1970-1971.	In Progress

FORMATIVE STUDIES

GENERAL

FORMATIVE STUDIES – GENERAL

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Scarf - 1970 Pupil Attitude Study December 1970	School Pair 1 305 IPI and 332 control pupils Grades 3-6	Pupil Opinionnaire	Semantic Differential technique was used to measure attitudes toward generalized concepts (eg. school, class), mathematics, reading, spelling and handwriting. Eighteen concepts were measured on nine scales.	Most of the significant differences were in favor of the control school (possibly due to the IPI school problems of principal's death & teachers strike), IPI pupils were more positive than control pupils on the concepts "I am" and "Working on my own in school is".
	School Pair 2 326 IPI and 249 control pupils Grades 3-6			Almost all the significant differences were in favor of the IPI School, with the greatest differences at the sixth grade level.
	School Pair 3 209 IPI and 191 control pupils Grades 3-6			More IPI pupils scored more positively and negatively than the control pupils.
	School Pair 4 173 IPI and 239 control pupils Grades 3-4			Few differences
	School Pair 5 225 IPI and 339 control pupils Grades 3-6			Few significant differences
	School Pair 6 237 IPI and 357 control pupils			Significant differences at the third grade level in favor of IPI and the fourth grade in favor of the control. Few differences in the fifth and sixth grades.

FORMATIVE STUDIES – GENERAL (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Scharf (RBS) - Teacher Attitude Study, Demonstration-Control School #4 - 1970	13 IPI teachers 21 control school teachers	Purdue Teacher Opinionnaire Structured (taped) interviews	100 item opinionnaire was administered to IPI and control teachers Seven basic questions composed the interviews which were conducted in April and May.	Teaching in the IPI program in an IPI school does lead to a more favorable attitude toward teaching and toward satisfaction with the particular school. Intensive negative feelings are apparent in the control school.
Scharf (RBS) - Teacher Attitude Study: The Effect of IPI Upon Job Satisfaction - Spring 1970	96 IPI teachers 96 control teachers Grades 1-6 in six IPI demonstration-development schools and six paired control schools	Purdue Teacher Opinionnaire	Among other factors, opinionnaire measured the effect of the following relevant factors: Curriculum issues Satisfaction with teaching Teacher Status School Facilities Teacher load	IPI teachers are significantly more positive toward "Curriculum Issues" than control teachers. IPI teachers do not object to the extra effort involved in individualizing instruction. IPI program seems to effect the greatest change in the attitude of "inner-city" school teachers.
Unks (RBS) - You were There - A Day in the life of an IPI Aide - 1970	82 Aides Six IPI demonstration-development schools	Questionnaire	A form consisting of 19 task categories was completed by aides for designated time periods in the winter and spring.	Most aide time is spent scoring worksheets and CETs. Tasks and time proportions in math and reading are similar, but differ for spelling, handwriting and science.

FORMATIVE STUDIES – GENERAL (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUCTIONS	DESCRIPTION	RESULTS
Unks (RBS) - A Pilot Study of Selected Intellectual Factors with Elementary School Schildren - 1969	1,325 pupils Grades 3-6 Three IPI demonstration-development schools and their control schools	"Measure of Children's Abilities: Productive Thinking - Series M" P. R. Merrifield	Five abilities relating to divergent productive thinking with semantic content were measured. The abilities and the instrument are based on theory derived from the structure of intellect model.	Divergent production tests can be scored reliably by non-professionals. Factor analysis resulted in three divergent production factors which were independent of verbal IPI and socioeconomic status. No treatment differences were found.
Weiler, Granowsky and Ball (RBS) - A Comparison of Recorded and Observed Instructional Settings – 1970	Three teachers One IPI demonstration-development school	Observation	Observed instructional techniques utilized were compared with those recorded on the prescription sheets by the teachers.	Teachers do not record the IT codes for much of the individualization which takes place.
Weinberger (RBS) - Summary and Comparison of Three Annual Conferences (1967 - 1968 - 1969) of Teachers and Administrators Using the Instructional System Individually Prescribed Instruction – 1969	IPI teachers	Workshops Questionnaires	Conference sessions are summarized and questionnaire results are presented.	Teachers perceive their role as more important than in traditional classes. Teachers perceive IPI for their pupils as being generally positive in the areas of achievement, motivation, discipline and believe the pupils will react positively to a totally "individualized" school day. Recommendations of school personnel and evaluation data have led to development of training materials for teachers and administrators and restructuring of the reading program.

FORMATIVE STUDIES – GENERAL (Continued)

AUTHOR, TITLE & DATE	POPULATION	INSTRUMENTS	DESCRIPTION	RESULTS
Welty (RBS) - Cost Benefit Analysis: Preliminary Reporting - 1970	Six IPI Demonstration-development schools	Bookkeeping records	Costs of IPI through fiscal year 1969 have been analyzed.	On the average the following item costs were incurred: Training 2% Materials & supplies 15% Personnel 45% Capital goods equipment 1% Travel 7% RBS staff 28% Consultants 2% This compares with the pilot schools as follows: Training 15% Materials & supplies 22% Personnel 62% Travel 1%

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PART III.

ANNOTATED BIBLIOGRAPHY

ANNOTATED BIBLIOGRAPHY

A constant problem at RBS has been one of developing the most effective lines of communication in order to share our work to date with the variety of audiences and requests received. Some people want to know all we know both verbally and in print; others are satisfied with brief generalizations.

The volume of mail for requests either in response to letters, or by furnishing written reports has reached a proportion of major concern to RBS. Both the time and cost have caused RBS to attempt a new mode of sharing.

Part III presents the major writings conducted about IPI since 1966. Several earlier references are included since the descriptions provide a valid link to the work of RBS–LRDC to date.

In addition to the annotation and index RBS is making provisions to handle all prior studies on a microfilming basis, at cost, thus eliminating tons of paper associated with studies to date. Arrangements are also being conducted to make all studies and data available through the ERIC (Educational Resources Information Center) System in the Office of Education, thus affording greater sharing and use. Meanwhile, serious researchers are invited to visit the RBS headquarters and use the studies in our library.

Future studies will be issued as technical papers in limited quantity and then placed on the microfilming system. Hopefully, the above method will provide faster access in reporting and also reduce the time and cost factor for RBS.

INDEX CATEGORIES

1. Author
2. Title
3. Year
4. LRDC
5. RBS
6. Rationale and Descriptive Papers
   a) IPI specific
   b) general, related programs, etc.
7. Testing
   a) general related theory
   b) IPI tests and testing program
8. Psychological Learning Modes and Learning Theory
9. Evaluation Questions and Design
10. Mathematics
11. Reading
12. Science
13. Oakleaf School
14. Other IPI Schools
15. Achievement
    a) measures of rate
    b) measured by IPI tests
    c) measured by standardized tests
    d) related factors
16. Attitude
    a) pupil
    b) teacher
    c) other
17. Pupil Activities
18. Teacher Activities
    a) prescription practices
    b) other functions
    c) training
19. Other Personnel Functions
    a) aides
    b) administrators
    c) LRDC
    d) RBS
20. Comparative Studies (IPI vs. non-IPI)
21. Objectives
22. Policy
    a) RBS Board
    b) Office of Education
23. News Media Releases
24. Handwriting
25. Spelling
26. Social Studies

Alberts, Ken. *An Evaluative Report on the 1968-1969 Math Project at Bonny Slope School, Oregon, 1969.*

Report briefly covers student attitudes (most positive at 5th and 6th grade levels); basic skills (highest growth at 6th grade level); functionality of IPI in local setting (easily incorporated). Teachers' adaptability (teacher unanimously in favor of IPI); teachers' behavior change in other areas (IPI ideas and methods tended to permeate the whole school . . .). School prestige (200 visitors); and weaknesses (revise some curriculum materials, especially on introductory concepts).

Indexed under 9, 10, 14, 15c, 16a & b, 18b.

Appel, Marilyn and Stolte, Joanne. *IPI Science, 1969 Summer Training Program.* Research for Better Schools, Inc., Summer 1969.

Training manual includes the three types of class models; inventory of prerequisite skills to enter the program; sequence and types of activities; prescription and profile sheets; use of the Audio Frame System; behavioral objectives of Levels A and B; sample lessons and a description of the materials.

Indexed under 5, 12, 17c.

Appel, Marilyn and Stolte, Joanne. *The Role of RBS in the Implementation of IPI Science.* Research for Better Schools, Inc., March 1970.

A professional paper delivered at the National Science Teachers Association Annual Meeting in March 1970. The paper delineates the functions and tasks of RBS personnel in the field trial and dissemination of IPI Science levels A and B. In addition, the paper discusses the problems of materials design and engineering.

Indexed under 6a, 12.

Appel, Marilyn and Stolte, Joanne. *The Assessment of Seven Existing Elementary Science Programs.* Research for Better Schools, Inc., June 1970.

A paper analyzing seven elementary science programs in terms of twenty-five criteria. These criteria were categorized according to 1) Curriculum Aspects, 2) Instructional Aspects, and 3) Practical Aspects. Each program was rated on a 0 to 3 scale and then given a total rating.

Indexed under 5, 6b, 12.

Bard, Bernard. *Prescription for Learning.* Parents' Magazine. pp 58-59, 113-114. September, 1970.

Description of IPI in general and at P.S. 134 in Bronx, New York. Report includes teacher and pupil attitudes in addition to evaluation information from RBS.

Indexed under 6a, 10, 14, 16a, 16b, 17.

Beck, Isabel L., Hubrig, Billie and Stone, Ruth. *1968-69 Reading Objectives, Experimental Edition with Explanations.* Working paper 30, Learning Research and Development Center, University of Pittsburgh, July 1968.

Sequenced list of IPI reading objectives with sample test questions and indication of method of presentation to be used.

Indexed under 4, 11.

Beck, Isabel L. and Bolvin, John O. *A Model for Non-Gradedness: The Reading Program for Individually Prescribed Instruction, Part III of a Symposium: Language Arts in the Non-Graded Schools.* Elementary English, XLVI:2, February 1969.

Succinct description of the IPI model for individualization. The article includes a selected linguistic approach to reading and its four stages: 1)pre-reading; 2) decoding; 3) comprehension and skills development; and 4) independent reading. There is a brief discussion of: objectives, diagnostic instruments, materials, individual prescriptions, classroom management, and data collection.

Indexed under 4, 6a, 7b, 11, 17, 18a, 21.

Beck, Isabel L. *Individualizing Reading Instruction—IPI Reading.* Learning Research and Development Center, University of Pittsburgh. Paper prepared for the Fifteenth Annual Convention of the International Reading Association, Anaheim, California, May 7, 1970.

A thorough description of the IPI Reading program is given. Materials and procedures of the program are discussed including revisions and suggested areas for future research and development.

Indexed under 4, 6a, 11.

Becker, James. *Discussion, Educational Technology: New Myths and Old Realities.* Harvard Educational Review, Vol. 38, No. 4, pp. 747-751, Fall 1968.

Response to an article in same issue by A. Oettinger. Discusses need for change in education by citing Newark, N.J. system as an example. Places blame for the present mess on "establishment" rather than on school administrators. States that educators are not the ones who make basic educational policy. Describes IPI as a strategy—a different view of the way teaching should be done. Rejects the idea that individualization of instruction must be synonymous with maximum freedom of activity for the pupil. States that IPI has never been billed as a panacea by LRDC or RBS.

Indexed under 5, 6a, 21.

Becker, James W. *Run Computer Run: A Critique.* Research for Better Schools, Inc., May 1968.

A paper prepared for the Conference on Information Technology and Secondary Education, Harvard University. The paper discusses social problems confronting innovations, a description of IPI as contrasted with individualization, and some premises for future consideration.

Indexed under 5, 6a, 21, 22a.

Becker, James W. *Toward Automated Learning.* Research for Better Schools, Inc., February 1968.

A professional paper delivered at the American Educational Research Association in February, 1968. The paper traces the essential elements of IPI from the paper-pencil mode into expanding uses with the computer including instructional management and computer-assisted instruction.

Indexed under 6a, 6b, 7, 8, 21.

Becker, James W. *Incorporating the Products of Educational Development into Practice.* Journal of Research and Development in Education. Vol. 3, No. 2, Winter, 1970, pp. 81-103.

Traces the development of IPI from program selection to actual practice. Provides criteria, a description of the model, the allocation of resources for educational development, and problems confronting the developer prior to institutional adoption.

Indexed under 5, 6, 10, 14, 19, 21, 22a, 22b.

Becker, James W. *Whatever Happened to the Computer?* Journal of Educational Data Processing. Winter, 1970.

Problems encountered in using the computer as a teacher include: 1) hardware including devices with educational specifications and an efficient and effective terminal 2) language in the need for a natural language 3) software, involving the invention of a simple author language 4) audio-visual in the need for full audio capabilities 5) lack of learning theories and practice 6) lack of R&D dollars 7) lead time of eight to ten years til complete operation if the money is invested now and 8) the funds for financing and staffing the schools in the next seven years could be redirected into computer technology.

The five major approaches to the use of technology in classroom instruction are described and examples given. They include micro-mini machines, plasma tube, television, computer managed instruction, and standard computer assisted instruction.

Indexed under 5.

Becker, James W. and Scanlon, Robert G. *Applying Computers and Educational Technology to Individually Prescribed Instruction.* Paper delivered at the Eastern Regional Conference on Science and Technology, Boston, Massachusetts. April 2-3, 1970.

Description of the three components of the Individualized Learning Program (IPI): Automated Learning Management System (ALMS) and Computer Assisted Instruction (CAI). Included are the basic aspects and development model of IPI, the initial design and operation of ALMS (an RBS-Westinghouse Learning Corporation-Quakertown, Pennsylvania cooperative project) as operates at Richland School, Quakertown, and the adaptation of IPI math materials to CAI as a joint RBS-School District of Philadelphia project using Philco-Ford hardware and SAVI terminals.

Indexed under 5, 6, 7b, 10, 14.

Bialek, Hilton M. and Perkins, Kristen. *A First Year Evaluation of Individually Prescribed Instruction (IPI) Programs in Four Schools in the Three-County Area.* Unpublished report, Project EDINN, George Washington University, Office of Sponsored Research, Monterey, California, August 1967.

One interesting finding is that IPI is easier to administer in some type of large group or multi-room complex rather than the self-contained classroom. It also seems that IPI effectiveness is highly dependent upon the availability and judicious assignment of adequate para-professional assistance. The report presents the results of a series of interviews with IPI teachers; an analysis of a questionnaire periodically administered to IPI and control students; an analysis of the effects of classroom communication patterns; a discussion of individualization based on IPI and conventional classroom assignments; and an analysis of progress based on both IPI and standardized test instruments.

Indexed under 9, 10, 11, 14, 15a, 15b, 15c, 16a, 16b, 17, 18a, 18b, 18c, 19a.

Bialek, Hilton M. and Castro, Barbara. *A Second Year Evaluation of Individually Prescribed Instruction (IPI).* Monterey, California, November 1968.

Four IPI and four control schools were compared in three main areas: 1) student attitude toward school and school subjects; 2) teacher and classroom activity and interaction; 3) student achievement over the school year.

Results show: 1) that students clearly like IPI, and that the structure of the program is attractive to pupils at all ability levels, especially those of low ability; 2) 63% of all communication in IPI classes are initiated by the students (vs. 34% in non-IPI classes); and that 70% of all interactions in IPI classes are non-instructional in content (vs. 43% in non-IPI classes); the latter finding is in contradiction to the first year's observations; 3) achievement test results for math and reading are presented.

Indexed under 9, 10, 11, 14, 15b, 15c, 16a, 20.

Bolvin, John O. *Variability of Pupil Achievement in Mathematics.* Paper presented at the annual meeting of the American Educational Research Association, Chicago, February 1966. Reprinted as Working Paper 4, Learning Research and Development Center, University of Pittsburgh, February 1966.

This study compares variability in achievement of Oakleaf pupils before and after the introduction of IPI. The results of pre- and post-testing with IPI Placement Tests are used, and the mean and standard deviation of units mastered is calculated for each grade. Variability for each grade with and without IPI is compared by matching grade one at the end of the school year with the grade two from the beginning of the year. All grades are equated on I.Q. In grades 1, 4, 5, and 6, the results of this comparison do not support the hypothesis that variability of achievement in individualized instruction is greater than in standard graded instruction. This may be due to a lack of a good measure of rate of achievement in IPI. Variability before is also measured by the Metropolitan Achievement Test and shows a general increase with number of years in school.

Indexed under 4, 10, 13, 15a, 15b, 15c, 18a.

Bolvin, John O. *Evaluating Teacher Functions.* Paper presented at the annual meeting of the American Educational Research Association, New York, February 1967.
Reprinted as Working Paper 17, Learning Research and Development Center, University of Pittsburgh, February 1967.

Teacher prescription practices are described in this report and two patterns of prescribing which teachers exhibit are identified. Some data in tabular form is presented to show length and types of prescriptions written by individual Oakleaf teachers for selected mathematics units. Though a few summary statistics are indicated, the analysis seems to be largely subjective. One conclusion noted was that prescription practices seem to be limited by the curriculum materials and student information readily available to the teacher. Some changes in prescription practices are shown over a two-year period, 1965-66, to 1966-67.

Indexed under 4, 10, 13, 15b, 15d, 18a.

Bolvin, John O. *The Use of Field Data for Improving IPI Materials and Procedures.* Unpublished paper, Learning Research and Development Center, University of Pittsburgh, December 1968. (Paper presented at the annual meeting of the American Educational Research Association, Los Angeles, February 1969).

The paper lists the sub-elements of the five major elements of the IPI plan: 1) a testing program; 2) prescription writing practices; 3) instructional materials and devices; 4) teacher classroom activities; 5) classroom management problems. It discusses the results of prescription data analysis, such as variability of prescriptions; the need for all present objectives

in the math continuum; and problem areas in terms of lesson materials.

Indexed under 4, 7b, 9, 17, 18a, 18b, 19, 21.

Bolvin, J.O. and Glaser, R. *Developmental Aspects of Individually Prescribed Instruction.* Audio-visual Instruction, October 1968.

This paper describes how the philosophy of IPI fits into the current trend in education and gives a brief discussion of the ways IPI attempts to individualize instruction through four general goals. A brief forecast for the future look of IPI is also made.

Indexed under 6a, 6b.

Bolvin, J.O., Lindvall, C.M. and Scanlon, Robert G. *A Manual for the IPI Institute.* Learning Research and Development Center, University of Pittsburgh and Research for Better Schools, Inc., June 1967.

A Manual used in the training of teachers and administrators at the 1967 IPI Summer Training Institute in Pittsburgh. It includes a rationale of a system of individually prescribed instruction, as well as detailed explanations of the procedures and practices involved in the program. It is a slightly revised edition of the 1966 Manual for the IPI Institute.

Indexed under 4, 5, 18c.

Boozer, Robert F. *An Overview of a Validation Study of the Sequencing Nature of Instructional Objectives.* Unpublished paper, University of Pittsburgh, June 1968.

This is a proposal for a study of whether the objectives in each IPI unit are scaled in the Guttman sense. The proposed application to IPI pretests of Lingoes' program for multiple scalogram analysis is outlined. Hypotheses concerning the curriculum to be tested by the study are stated.

Indexed under 4, 7a, 9, 10, 13, 15b.

Boozer, Robert F. *A Study of the Relationship Between IQ and Units Mastered Per Year, Mathematics 1967-68.* Unpublished paper, Learning Research and Development Center, University of Pittsburgh, July 1968.

Data is presented which indicates a slight relationship between IQ and one measure of rate at Oakleaf for 1967-68.

Indexed under 4, 10, 13, 15a, 15d.

Boozer, Robert F. *Evaluation of the Variability Among Students in Total Number of Units Mastered Per Year.* Unpublished paper, Learning Research and Development Center, University of Pittsburgh, Summer 1968.

This paper provides variability data for each grade at Oakleaf for 1967-68 in both math and reading.

Indexed under 4, 10, 11, 13, 15a.

Brown, Mary V. *A Summary of Summer Training – IPI Demonstration Schools.* Research for Better Schools, 1969.

This report includes the complete copy of the training design, session schedules, materials, consultant and session trainer evaluation forms for the six IPI demonstration schools covering IPI math, reading, spelling, handwriting and innovation analysis seminars (at 3 sites only).

Indexed under 5, 10, 11, 12, 14, 18a, 18b, 18c, 24, 25.

Brown, Mary V. *The IPI Continuous Training Series: Multi-Media Units 1-25.* Research for Better Schools, 1969.

A draft of units that provide ideas and suggested procedures to aid an IPI teacher in refining instructional skills, in gaining a better understanding of individualized instruction and in utilizing available teaching strategies, materials.

Indexed under 5, 10, 17, 18b.

Brown, Mary V. *Use of Instructional Techniques.* Research for Better Schools, 1969.

An illustrated booklet on the appropriate use of the coded instructional techniques on the prescription form in IPI math.

Indexed under 5, 10, 18a.

Brown, Mary V. *The ATP Model: Year II.* Research for Better Schools, 1970.

Observations and critiques on the decentralized mode of training administrators in IPI system by personnel (RBS and ATP site trainers) involved. Comparisons are made with an initial trial of same model and with centralized mode formerly used.

Indexed under 5, 10, 14, 19b.

Brown, Mary V. *The 1970 Administrative Training Programs for IPI Math.* Research for Better Schools, 1970.

The manual of materials used to train IPI administrators in implementation of and supervision-coordination of IPI math program. It contains pertinent items related to instructional leadership and management tasks.

Indexed under 5, 10, 14, 19b.

Brown, Mary V. *A Review of the Administrator Seminar Series.* Research for Better Schools, 1970.

A review of the meeting series held for administrative personnel from RBS demonstration schools; contains all pertinent materials used and includes informal evaluation notes by participants from RBS and demonstration schools.

Indexed under 5, 10, 11, 14, 16c, 19b, 24, 24.

Brown, Mary V. *Participant Evaluation of the 1970 Math ATP Model, Phase I (May-August).* Research for Better Schools, 1970.

Data gathered during the major phase of administrator training from trainees, ATP trainers and RBS personnel.

Indexed under 5, 10, 14, 16c, 19b.

Brown, Mary V. *Participant Evaluation of the 1970 Math ATP Model, Phase II (Sept.-Dec.)* Research for Better Schools, 1970.

Informal data gathered during the post-major phase of administrator training from RBS personnel.

Indexed under 5, 10, 14, 16c, 19b.

Brown, Mary V. *The 1970 Administrative Training Programs for IPI Reading: Stage IV.* Research for Better Schools, 1970.

The manual of materials used to train administrators in their IPI reading role. It contains Basic ATP Information, Stage IV

Guide, IPI Skills Continuum, Directing Reading, Management of IPI Reading, Appraisal of IPI Reading, and IPI Reading Glossary.

Indexed under 5, 11, 14, 19b.

Brown, Mary V. *The 1970 IPI National Teacher Training Sessions.* Research for Better Schools, 1970.

A review of the training sessions held at schools implementing IPI math in 1970-1971 school year. Contains basic training designs used, consultant evaluations and pertinent materials.

Indexed under 5, 10, 14, 16b, 18a, 18b, 18c.

Bruce, James D., Bryan, Dana C. and Leiphart, Jeffrey M. *Individually Prescribed Instruction in Mathematics.* An Evaluation of a Special Academic Program Conducted at the Greendale Day School, Devon, Pa. October 1970.

The feasibility of using the California Achievement Test (CAT) to evaluate the Greendale IPI Program was studied since pupils were not achieving a grade level a year in math as they were in reading. Results show that IPI seems to be geared towards math reasoning rather than concrete fundamentals; the positive effect of IPI seems to be more pronounced during the student's first year of the program; the CAT may not be an appropriate measure of what the IPI program teaches; and since data is based on 34 students, limitations exist.

Indexed under 10, 14, 15c.

Buccino, Ernest. *1970 IPI Reading Training Program, Daniel J. Flood Elementary School, Wilkes-Barre, Pennsylvania.* Research for Better Schools, Inc., July 1970.

Report on a Reading Training Session. Training session appraisal criteria are described and applied. Recommendations for future training sessions and appraisal are made.

Indexed under 5, 11, 14, 18c.

Buccino, Ernest. *Reading Diagnostic Instruments.* Research for Better Schools, Inc., 1970.

Study examines IPI Reading Skills Continuum Placement Tests and Pretests. Three questions are considered. Are the Placement Test scores and the Pretest scores consistent? Is there variance in degree of difficulty? Are there differences by grade? The results show that in general the scores are consistent. The tests do vary in difficulty. Students do differ by grade with older children usually working on higher levels; however, the program provides for rapid movement by advanced students beyond their ordinary grade level. It is recommended that special attention should be given to the tests identified as being most difficult.

Indexed under 5, 7b, 11, 14.

Chitayat, Linda. *An Investigation of Formative Evaluation Procedures for Use in the In-Context Tryout of Lesson Materials and Associated Instructional Procedures.* Unpublished Master's Thesis. University of Pittsburgh, 1970.

Procedures were developed 1) to collect and use objective and subjective data to pinpoint weaknesses in the materials and planning system and 2) to evaluate the findings by systematic implementation of suggested changes. Investigated in this study were the procedures 1) in-classroom evaluation with the investigator as an observer obtaining information on "time" and data from lesson booklets and test scores 2) observer-supervised classroom with unlimited enrollment and 3) observer-supervised classroom with limited enrollment.

Indexed under 7b, 9, 10, 13.

Coleman, William A. *As Fast as Your Brain Knows How.* Parade Magazine, September 1968.

Article discusses the enthusiasm with which children, teachers, parents, and the Office of Education view IPI. Two case studies of fifth grade transfers to Oakleaf are used as illustration.

Indexed under 6a, 13, 17.

Cooley, William W. and Glaser, Robert. *The Computer and Individualized Instruction.* Science. Volume 166. pp. 574-582. October 31, 1969.

Included is a thorough description of the computer-managed instruction (CMI) system for Oakleaf School. Classroom and research utilization of the system is illustrated.

Indexed under 4, 8, 10, 13, 18.

Cooley, William W. *Computer Assistance for Individualized Education.* Journal of Educational Data Processing. Volume 7. Pages 18-28, 1970. Reprinted as Working Paper 57, Learning Research and Development Center, University of Pittsburgh, 1970.

IPI is described 1) as it was developed, 2) as it operates at Oakleaf School using a computer management system and, 3) with future possibilities including Computer Assisted testing and instruction. The time schedule for the computer project includes a 1970-71 CAI installation of the system in one IPI school with 1971-74 for continued research and development and 1974 for evaluation of the completed system.

Indexed under 4, 6a, 7b, 8, 10, 13.

Cox, Richard C. *Item Selection Techniques and Evaluation of Instructional Objectives.* Journal of Education Measurement 2:181-185, 1965. Reprint 4, Learning Research and Development Center, University of Pittsburgh, 1965.

The use of statistical item difficulty and discrimination indices as criteria for selecting these items is shown to alter the content of the test according to Bloom's Taxonomy of Educational Objectives. This implies that the Test may not be a valid measure of intended objectives after statistical item selection techniques are applied.

Indexed under 4, 7a.

Cox, R.C., et. al. *A Description and Interim Evaluation Report Concerning the First Two Years of the Individually Prescribed Instruction Project.* Learning Research and Development Center, University of Pittsburgh, December 1966.

This is the first comprehensive unpublished evaluation report on IPI containing a description of school variables, IPI in the Oakleaf school, pupil placement, pupil advancement, retention of learned materials, comparison studies, prescription writing, non-cognitive variables, and an extensive bibliography.

Indexed under 4, 6a, 7b, 9, 10, 11, 12, 13, 15a, 15b, 15c, 15d, 16a, 16b, 17, 18a, 18b, 18c, 19c, 20.

Cox, R.C. and Graham, G.T. *The Development of a Sequentially Scaled Achievement Test.* Journal of Educational Measurement, 3:2, Summer, 1966. Re-

print 18, Learning Research and Development Center, University of Pittsburgh, 1966.

A preliminary study of the feasibility of applying Guttman scalogram analysis in achievement testing for individualized instruction is reported. The test developed is based on selected objectives from the IPI math curriculum.

Indexed under 4, 7a, 10.

Cox, R.C. and Boston, M. Elizabeth. *Diagnosis of Pupil Achievement in the Individually Prescribed Instruction Project.* Working Paper 15, Learning Research and Development Center, University of Pittsburgh, November 1967.

This is a description of the criterion-referenced diagnostic instruments designed for IPI, their purposes, and how they are used in the instructional process. Sample tests are included.

Indexed under 4, 6a, 7b, 10, 11, 12.

Cox, R. C. and Sterrett, Barbara G. *The Application of a Model for Deriving More Meaning from Standardized Test Results.* Paper presented at the annual meeting of the National Council on Measurement in Education, Chicago, February 1968. Reprinted as Working Paper 42, Learning Research and Development Center, University of Pittsburgh, 1968.

The model provides a procedure for using a standardized achievement test as a criterion-referenced measure, essentially giving each pupil two scores—one on material he has studied and should be expected to know, and the other on material he is not expected to know. Data on IPI pupils is used to exemplify the model.

Indexed under 4, 7a, 10, 15b, 15c.

Deep, Donald. *Changing Role of Teachers.* Pennsylvania School Journal, 116:7, March 1968.

A description of teacher functions and activities in IPI.

Indexed under 6a, 13, 18a, 18b.

Deno, Stanley R. and Jenkins, Joseph R. *Evaluating Preplanned Curriculum Objectives.* Research for Better Schools, Inc., 1967.

Thirteen elementary and secondary teachers analyzed a sampling of instructional objectives contained in the IPI Mathematics Continuum. Objectives were analyzed according to context, specificity and criterion as advocated by leading authorities on behavioral objectives. Findings indicated that IPI mathematics objectives are a more general statement of expected performance level than that specified by the often restrictive and ambiguous recommendations of adherents to the components of context, specificity and criterion.

Indexed under 5, 9, 10, 21

DeRenzis, Joseph J. *A Summary List of Problems that Exist in the Standard Teaching Sequence Booklets Which are Used in the IPI Mathematics Curriculum, Including Some Suggested Changes.* Research for Better Schools, Inc., April, 1969.

Tables summarize typographical errors such as omissions, misprints, printing quality, computational errors, etc. In addition, some specific suggestions are made regarding sequencing, the writing of directions, and the use of illustrations.

Indexed under 5, 10.

DeRenzis, Joseph J. *An Investigation into the Attitude Patterns and their Relationship to Prescription Writing Procedures of Teachers Using the IPI Instructional System in Elementary Mathematics.* Unpublished E.Ed. Dissertation, Temple University, Philadelphia, Pennsylvania, 1970.

The purpose of this study was to analyze the relationship between the prescriptions teachers write in IPI Mathematics and the attitude patterns of these same teachers as identified by the Runner Studies of Attitude Patterns—Interview Form III. By means of the RSAP each teacher was categorized as rigid, flexible or overly-flexible. Each of these categories was further classified as "control-oriented" or "freedom-oriented." Pupils' completed mathematics prescription sheets were collected for ten students in each of the 208 participating teachers' classrooms. The prescription writing procedures of these teachers were categorized as correct according to Criteria for Mathematics Prescription Evaluation. Results indicated, 1) RSAP can identify rigidity, flexibility and overflexibility among IPI teachers. 2) Not all teachers may be able to adapt to a system such as IPI and 3) increased years of teaching do not assure correct prescription writing procedures on the part of all teachers.

Indexed under 5, 10, 15d, 16d, 18a.

DeRenzis, Joseph J. *Individually Prescribed Instruction—A Guide for the Reading Program.* Learning Research and Development Center, University of Pittsburgh and Research for Better Schools, Inc. (September 1969) Revised June, 1970.

An operational guide explaining, in a sequential way, the procedures to be followed in implementing IPI reading.

Indexed under 1, 4, 5, 6a, 11.

Derr, Ted. *Guide to Handwriting Program, 1970-1971.* Research for Better Schools, Inc., Philadelphia, Pa. September, 1970.

Included are the four phases of writing behavior that a child progresses through in becoming a legible writer including descriptions of student behavior and suggested strategies and procedures that will permit each child to acquire or demonstrate his competencies of each behavior. These strategies and procedures have been designed for teacher and student use in six schools to allow each child to move from each behavior according to his particular rate of learning and his present competencies. Included in this Guide are procedures for using an evaluative instrument, the Gradients Scale, to analyze printing or writing.

Indexed under 5, 24.

Dougherty, John. *The IPI Mathematics Program, Implementation Report, Phase I.* (September-December, 1968). Research for Better Schools, Inc., 1969.

This is a collection of working papers relating to the nationwide diffusion of the IPI Mathematics program. In-

cluded are reports of visits by RBS personnel to IPI schools in twenty-six states, plus an introductory section presenting the rationale for the activity and some tentative conclusions:

Indexed under 5, 10, 14, 19d.

Dougherty, John. *The IPI Mathematics Program Implementation Report, Phase I, Vol. II.* Cooperating Regional Educational Laboratory Documents. Research for Better Schools, Inc., 1969.

This is a collection of working papers relating to the efforts by RBS to involve operational personnel in other regional labs in the diffusion of the innovation known as Individually Prescribed Instruction (IPI). Included are lab schedules for school visits, minutes of meetings, reports of school visits and other relevant materials.

Indexed under 5, 10, 14, 19d.

Dudley, Charles J., Smith, Keith F., and Pellegrin, Roland J. *The Decision-Making Structure of Schools.* Unpublished paper, Center for the Advanced Study of Educational Administration, University of Oregon. (Paper presented at the annual meeting of the American Educational Research Association, Los Angeles, February 1969.)

The study deals with perception of the authority structures held by teachers, principals, and other personnel. The types of schools in the study were: Multi-Unit Schools and their controls (Wisconsin); IPI Schools and their controls; and six schools in one State of Washington school district. The results showed little variability among the control schools where the principal plays a strong consultative role, and among IPI schools, where the IPI coordinator plays a prescriptive role. The Multi-Unit Schools showed much variability of authority structure, but all showed a strong trend toward group decision-making.

Indexed under 14, 18b, 19b.

Eidell, Terry L., Little, Ronald and Thorlacius, Jon. *Uniformity and Variability in the Organizational Characteristics of Elementary Schools.* Unpublished paper, Center for the Advanced Study of Educational Administration, University of Oregon. (Paper presented at the annual meeting of the American Educational Research Association, Los Angeles, February 1969.)

Four instruments measuring: 1) job satisfaction; 2) pupil control orientation; 3) reference group orientation, and 4) leadership of school principals were administered to a sample of teachers from four different types of schools—3 IPI Schools; 3 Control Schools; 3 Multi-unit Control Schools for Project Models. Results are not clear, and are explained in terms of regional differences.

Indexed under 14, 16b, 18b, 19b.

Elk Grove Illinois School District with the cooperation of Dr. Robert Stake, University of Illinois. *Individually Prescribed Instruction: A Study of Independent Behavior.* Unpublished report, February 1968.

The study was undertaken to evaluate the effect of IPI on the independent behavior of gifted (+120 I.Q.) children in two schools of the District. Two hypotheses also dealt with the utilization of time and positive attitudes toward school.

Indexed under 4, 5, 6a, 9, 10, 11, 14, 16a, 16b, 16c, 17, 18a, 18b.

Fairgrieve, George. *Evaluation of the IPI Math Program of McMorrow School,* Richland Heights, Missouri, 1969.

The data brought together for this report indicates that achievement test data suggests that IPI Math can bring about pupil progress equal to that experienced in a traditional program and indicate possibilities for improving this progress. Questionnaires administered to pupils, teachers, and parents indicate strong approval of the program and indicate that it is truly individualizing instruction. Observational data, while limited at this time, suggests that fears regarding restrictions of interaction of children are not well founded.

Indexed under 10, 15c, 16a, 16b, 16c, 17.

Fairman, Marvin. *Individualizing Instruction Through I.P.I. Educational Leadership.* pp. 133-136. November, 1970.

Article on IPI at Daniel Boone Elementary School, Missouri: its selection and general description. IPI math program was evaluated on the basis of the four major components of the school's philosophy, 1) pupil responsibility, 2) pupil uniqueness, 3) self-directing pupils, 4) self-educating pupils.

Indexed under 6a, 10, 14, 17.

Fawcett, M. Temple. *Aiding IPI: A Manual for Aides in IPI Mathematics.* Research for Better Schools, 1969.

A self-teaching manual for IPI math aides that gives general information about IPI familiarization with IPI materials, practice in IPI tasks, and suggestions that make an aide's job easier and more efficient.

Indexed under 5, 10, 14, 19a.

Fawcett, M. Temple. *Aiding IPI.* Research for Better Schools, 1969. (Media: Sound Filmstrip)

Sound filmstrip that depicts the role of an aide in the IPI system; can be used alone and in conjunction with *Aiding IPI* manuals.

Indexed under 5, 10, 14, 19a.

Fisher, Jack R. *An Investigation of Three Approaches to the Teaching of Mathematics in the Elementary School.* Unpublished doctoral dissertation, University of Pittsburgh, 1967.

Procedural differences between standard classroom instruction, programmed instruction, and IPI are described. Differences in student achievement in the three programs as measured by standardized tests are negligible.

Indexed under 6a, 6b, 10, 15c, 17, 18a, 18b, 19a.

Fisher, Jack R. *Audio-Visual Sources for IPI Mathematics.* Research for Better Schools, Inc., 1969.

A complete source on films, transparencies, filmstrips and film loops correlated to the IPI math objectives of 68-69. Contains titles, specific content, and the commercial source.

Indexed under 5, 10, 21.

Friends School, Wilmington, Delaware. *Individually Prescribed Instruction in the Friends School, 1967-68.*

A descriptive paper discussing the history and philosophy of individualization at Friends School, reasons for the selection of IPI, faculty preparation, and the essential elements of IPI.

Indexed under 6a, 14, 18c.

Friends School, Wilmington, Delaware. *Evaluation of and Information Concerning Individually Prescribed Instruction, 1968-69.*

The assessment of student progress begun in 1967 was continued. Included are a comparison of placement test scores of September 1967 and September 1968 and June 1968 achievement level, range of achievement, and range of learning (units passed).

Indexed under 10, 14, 15a, 15b.

Foust, William E., Walnut Lake Development Plan. *Individually Prescribed Instruction Report 1968-69.* Bermingham, Michigan, June 1969.

General description of training program, budget, continuing evaluation efforts and a mention of staff enthusiasm for the IPI program. Various charts used at the school are attached, along with a summary of the results of a parent questionnaire.

Indexed under 14, 16c.

Gallagher, Peter K. *The Evaluation of Student Achievement in the Individually Prescribed Program in Mathematics at the Frank A. Berry School, Bethel, Conn.* Graduate School of Education, Fairfield University; May 1968.

The study tested the following hypotheses:

1. There will be significant differences in self-reliance, personal worth and school relations of the pupils engaged in IPI as compared to those in control classes. (Measure: California Test of Personality.) Results: Significant.
2. There will be significant differences in attitude towards Arithmetic of the IPI pupils as compared to the control classes. (Measure: Student Attitude Test toward Arithmetic.) Results: Significant.
3. The arithmetic achievement will be higher in the IPI classes than in the non-IPI classes. (Measure: Stanford Achievement Test.) Results: Not significant.
4. There will be some statistical difference in the learning progress of those children classified as culturally disadvantaged in the IPI calsses. (Measure: Stanford Achievement Test.) Results: Not significant.

Indexed under 9, 10, 14, 15c, 16a, 20.

Gehret, Kenneth. *Individually Prescribed Instruction: Improving Education Through ESEA.* pp. 34-39. January, 1970.

This report includes a description of RBS role in IPI dispersion and the operation of IPI at Richland School, Quakertown, Pennsylvania.

Indexed under 6a, 10, 14, 18a, 18b, 17, 19d.

Glaser, Robert. *Instructional Technology and the Measurement of Learning Outcomes: Some Questions.* American Psychologist, 18:8, 1963.

A distinction is made between norm-referenced and criterion-referenced tests, their characteristics and uses for evaluating achievement. Suggests differential procedures of item selection for the two different types of tests.

Indexed under 7a.

Glaser, Robert. *The New Pedagogy.* Working Paper 1, Learning Research and Development Center, University of Pittsburgh, November 1965.

This paper sets an integrated conceptual framework for the R&D Center, giving rationale for the efforts in individualization of instruction, computer assisted instruction and psychologically based instructional design.

Indexed under 4, 6b.

Glaser, Robert. *The Program for Individually Prescribed Instruction.* Paper presented at the annual meeting of the American Educational Research Association, Chicago, Illinois, February 1966. Reprinted as Working Paper 2, Learning Research and Development Center, University of Pittsburgh, February 1966.

This paper gives a description of Oakleaf IPI and how it fits into Chronbach's three patterns for adapting education to individual differences. Bar graphs are presented which show initial placement level and units mastered in one school year for each child at Oakleaf in the three areas of mathematics, reading, and science.

Indexed under 4, 6a, 10, 11, 12, 13, 15b.

Glaser, Robert. *The Education of Individuals.* Working Paper 12, Learning Research and Development Center, University of Pittsburgh, September 1966.

This paper presents some of the background thinking and rationale for IPI though IPI is not mentioned explicitly. Chronbach's patterns for adapting education to individual differences are reviewed.

Indexed under 4, 6b.

Glaser, Robert. *Objectives and Evaluation: An Individualized System.* Science Education News, American Association for the Advancement of Science, June 1967, pp. 1-3. Reprint 24, Learning Research and Development Center, University of Pittsburgh, 1967.

This article is a plea for operational specification of instructional objectives. It also mentions the need for criterion-referenced measures (as opposed to norm-referenced measures) in order to assess pupils' achievement of those objectives.

Indexed under 4, 6b, 7a.

Glaser, Robert. *Adapting the Elementary School Curriculum to Individual Performance.* Address delivered at the 1967 Invitational Conference on Testing Problems on 28 October, 1967, at the Hotel Roosevelt, New York City, under the auspices of the Educational Testing Service, Princeton, New Jersey. Reprint 26, Learning Research and Development Center, University of Pittsburgh, 1967.

This is a general report about the nature of IPI, including a description of the computer management system at Oakleaf and samples of James Weiler's graphic progress report outputs for individual pupils.

Indexed under 4, 6a, 7b, 8, 10, 13, 15a, 15b.

Glaser, Robert. *Discussion, Educational Technology: New Myths and Old Realities.* Harvard Educational Review, Vol. 38, No. 4, pp. 739-746, Fall 1968.

Response to an article in same issue by A. Oettinger. Defends the goal of individualizing of instruction as the most pressing need in education today and in the foreseeable future. Discusses IPI as one model of individualization. Discusses ways of effecting changes in schools despite their acknowledged resistance to same.

Indexed under 4, 6a, 6b, 8, 21.

Glaser, Robert and Nitko, Anthony J. *Measurement in Learning and Instruction.* Learning Research and

Development Center, University of Pittsburgh, October, 1969. Chapter to appear in R. L. Thorndike (Ed.) Educational Measurement.

Measurement is examined in light of a general model for individualization and adapting instruction to individual differences. Included is a review of relevant learning and measurement theory in terms of making instructional decisions about individual learners, analysis of performance domains, individual assignments to instructional alternatives, uses of criterion referenced tests, and formative evaluation.

Indexed under 4, 7a, 7b, 8, 9.

Graham, Glenn T. *Sequentially Scaled Mathematics Achievement Tests: Construction Methodology and Procedures.* Unpublished doctoral dissertation, University of Pittsburgh, 1966.

The feasibility of developing sequentially scaled tests for criterion-referenced measurement of achievement was investigated. Guttman scalogram analysis to construct scaled tests based on the IPI mathematics continuum. Reliability, validity, and item analysis techniques for resultant tests were examined.

Indexed under 7a, 7b, 10, 13, 20, 21.

Graham, Martha (ed.) *The IPI World: Individually Prescribed Instruction, News and Comments.* Volume 1:1, 1:1-5 and 2:1, 2. Appleton-Century-Crofts, Educational Division, Meredith Corp., Washington, D.C., February, 1969. (Newsletter)

Information is provided for the schools throughout the country which are field testing and utilizing the IPI mathematics program. Articles are written by LRDC and RBS staff and school personnel.

Indexed under 6a, 10, 13, 14, 16a, 16b, 17, 18a, 18b, 18c.

Hammond, Kathie. *Six Case Studies–First Year Costs of Adopting IPI Mathematics.* Research for Better Schools, Inc., July, 1970.

A description of the costs incurred by six different types of schools. Included is a brief description of the schools, costs incurred before the decision was made to adopt IPI, costs of training, cost of all materials and equipment purchased specifically for IPI, and salaries of any additional personnel hired for the IPI program. Per pupil cost for IPI ranged from $31.18 to $236.08.

Indexed under 5, 10, 14.

Heathers, Glen. *Learning, Mental Health, and Testing.* Speech presented at the annual convention of the National Education Association for Supervision and Curriculum Development, San Francisco, March 15, 1966. Reprinted as Working Paper 18, Learning Research and Development Center, University of Pittsburgh, 1966.

A few recommendations are made in this report for testing procedures based on new curriculum developments. IPI is cited as an example.

Indexed under 4, 6b.

Heathers, Glen. *Self-Directed Learning: The Master Key to Educational Reform.* Education in ferment: Presentation from the 1967 Fifteenth Annual Workshop, State Federation of the District Boards of Education of Atlantic City, New Jersey, October, 1967.

Self-directed learning is discussed as a necessary aspect of new educational programs. IPI is reported as an example of a program which allows for limited self-direction.

Indexed under 6b, 8.

Hestwood, Diana. *Individually Prescribed Instruction–Hall School.* Minneapolis, Minnesota. September, 1970.

This paper describes the IPI system and reports the first year evaluation at Hall School. Results show pupil progress in the IPI continuum, pupil attitude in terms of math popularity, positive teacher attitude, and gains on the Iowa Test of Basic Skills–Modern Math Supplement for grade 6. As a target school, the sixth grade was compared with three other target area schools. On the pretest, Hall was tied for the lowest raw score on the pretest, but by the end of the year was tied for the highest median raw score.

Indexed under 6a, 10, 14, 15b, 16a, 16b, 20.

Hoeltze, G.M. and Gilchrist, Robert S. (Consultants). *An Evaluation of the Educational Program of Pawnee School District 110, Shawnee Mission, Kansas, 1969.*

A study of the effect of various educational innovations at Pawnee. The innovations include team teaching, IPI math and "individualized" other subjects. Pawnee was compared with a control school on the: 1) SAT, 2) ITBS and, 3) SCALS (Self-Concept as a Learner). There were a few significant differences, and the writers cautioned against the value of such standardized tests to measure untraditional objectives. Two other instruments were a Parent and a Teacher Questionnaire. Most parents were generally pleased with the school, and Pawnee teachers were exceedingly enthused about the benefits and excitements of the innovative efforts at their school. They did, however, express the need for formally programmed "individualization" in the other subjects, as they had no time to work this out by themselves.

Indexed under 9, 10, 14, 15a, 15c, 16a, 16b, 20.

Holzman, Seymour. *A One-to-One Ratio.* Scholastic Teacher, March 1969.

Gives a brief description of IPI as demonstrated in the Richland School, Quakertown, Pennsylvania. Article cites expressions of teacher opinions as to what type child IPI serves best.

Indexed under 6a, 14, 15d, 16b.

Hubrig, Billie and Stone, Ruth. *1967-1968. Reading Curriculum, Experimental Edition with Explanations.* Working Paper 28, Learning Research and Development Center, University of Pittsburgh. Printed by Research for Better Schools, Inc., September 1967.

Sequenced list of IPI reading objectives with sample test questions and indications of method of presentation to be used.

Indexed under 4, 11.

Humphrey, Jan. *Self-Concept of Ability in IPI and Non-IPI Students.* Unpublished paper, Learning and Research and Development Center, University of Pittsburgh, July 1968.

The purpose of this study was to test the hypothesis that students who had been in IPI should have stronger self-concepts of ability as learners than those in regular classes. A questionnaire was administered to 791 seventh grade students. The results did not support the hypothesis. IPI girls showed a decrease in self-concept of ability when they moved from IPI into a regular seventh grade program.

Indexed under 4, 13, 16a, 20.

Humphrey, Jan. *Specific Subject Self-Concept in IPI and Non-IPI Students.* Unpublished paper, Learning Research and Development Center. University of Pittsburgh, July 1968.

Four hundred eighty-eight seventh grade students (including 21 who had had IPI in the 6th grade) responded to a questionnaire containing items on self-concept of abilities in math, english, social studies and science, and on their liking of these subjects. Results supported a previous finding that as one's self-concept of ability increases, there is a greater tendency for one to like the current course. The IPI subjects, however, departed from this tendency by preferring their 6th grade IPI Math course (regardless of math self-concept). This did not happen with reading and science, however.

Indexed under 4, 16a, 20.

Independent School District 273. *IPI Evaluation—Highlands Elementary School.* Highland Park, Illinois 1970.

This paper is a report of a school district's evaluation of IPI. After one year of IPI math the IPI school was compared to its matched control school. The evaluation is divided into three parts: parent reaction to the program; students' attitude toward math before and after the experience and compared to the control school; and achievement results based on the Iowa Test of Basic Skills and compared to the control school.

Results: In general the parents seemed very well pleased with the IPI program on all points questioned. It appears there was a greater interest in Math in the IPI group. On the Iowa Test of Basic Skills complete battery including the Modern Math Supplement both the IPI and control group showed some overall improvement with the control group showing greater improvement.

Indexed under 10, 14, 15a, 16a, 16c, 20.

Individually Prescribed Instruction. Research for Better Schools, Inc., 1969.

Distributable-type brochure includes a brief history of individualization; the background of IPI—its distinguishing fundaments and diagnostic instruments; the role of RBS in disseminating, training and evaluating; discussion of the math and reading curricula; general-type questions and answers.

Indexed under 4, 5, 6a, 7b, 10, 11, 21.

John Marshall Elementary School. *Individually Prescribed Instruction in Mathematics.* Newport News Public School System, Virginia, 1969.

The report cites detailed descriptive data on Marshall pupils, staff and facilities and gives a summary of basic IPI practices and principles. The implementation of the program, as well as the roles of the teacher, floater, aide and principal is discussed. Examples of the report form used at the school, and of the placement profile and prescription sheet, are included. There are also a number of good photographs illustrating IPI in action.

Indexed under 6a, 14, 17, 18a, 18b, 18c, 19a, 19b.

Klopfer, Leopold E. and Weber, Victor L., Jr. *IPI Science: A Teaching Revolution in the Making.* Science Activities, Vol. 1, pp. 23-30, Reprint 31. Learning Research and Development Center, University of Pittsburgh. June 1969.

Individualization goals of the IPI program in general and the three specific instructional goals of the science program (affective, inquiry and scientific literacy) are discussed. In addition, the operation of the program is briefly described.

Indexed under 4, 6a, 12, 13.

Klopfer, L. E. *Goals and Scope of IPI Science: An Interim Report.* Learning Research and Development Center. University of Pittsburgh, January 30, 1970.

Introduction describes the importance of designing a science program to meet challenge of the scientific and technological transformation of society. The principle goals of the program (student self-direction, student co-evaluation, affective, inquiry, and scientific literacy) are stated along with 16 behavioral components and illustrations.

Indexed under 4, 6a, 12.

Klopfer, Leopold E. *Student Behavior and Science Content Categories and Subcategories for a Science Program.* Learning Research and Development Center, University of Pittsburgh. January, 1970.

Description of categories and subcategories of student behavior and science content. The student behaviors include knowledge and comprehension, processes of scientific inquiry, application of scientific knowledge and methods, manual skills, attitudes and interests, and orientation. Composing science content are biological sciences, physical sciences and general (e.g., historical development, mathematics in science, measurement).

Indexed under 4, 6a, 12.

Learning Research and Development Center and Research for Better Schools. *Interim IPI Mathematics Continuum, 1969-70.*

This is a continuum of objectives which has been evolved from the former continuum by LRDC and RBS personnel. The revision effort was guided by data feedback from the RBS Appraisal section, survey forms supplied by RBS to (and received from) participating schools, voluntary school reports, RBS analysis of standardized tests, and the cumulative experience of LRDC observations at the Oakleaf Elementary School of the Baldwin Whitehall School District, Pittsburgh, Pennsylvania.

Indexed under 4, 5, 10, 13, 14, 21.

Leland, Lyle L. *A Comparison of Gains in Math Achievement (Elementary School Math and IPI).* Gertrude M. Carmen School, Waukegan, Illinois. June 1969.

The study compared SAT scores of the same 4th, 5th, and 6th grade children after at least one year of the ESM program (before September 1968) and after a year of the IPI Program (after September 1968). The results showed that the IPI experience led to improvements in the Concepts and Applications on the SAT, but not in Computation.

Indexed under 10, 14, 15c, 20.

Lewy, Rafael A. *Individually Prescribed Instruction and Academic Achievement.* A Report on an Experimental Project. Arlington Heights, Ill. March 1969.

Study was designed to measure the effect of IPI on achievement of fourth and fifth graders. No significant differences were found between IPI and non-IPI pupils on the Iowa Test of Basic Skills, a free-writing sample, an IPI language test, and an IPI math test.

Indexed under 6a, 10, 11, 14, 15b, 15c.

Lindvall, C.M. *Criteria for Stating IPI Objectives.* Unpublished paper, Learning Research and Development Center, University of Pittsburgh, July 1968.

States requirements for developing sequences of objectives. Presents suggestions for defining the structure within units (applicable to different subject areas).

Defines and illustrates IPI units (i.e. a limited number of "unified" objectives); discusses the need and form of an overall goal for a unit in terms of evaluation and pupil performance.

Indexed under 4, 21.

Lindvall, C.M. *Instructional Design.* Unpublished paper, Learning Research and Development Center, University of Pittsburgh, 1968.

Discusses the need for development and refinement of IPI curricula, as suggested by Robert Glaser in the NSSE Yearbook, The Changing American School, 1966, pp. 215-42, also LRDC Reprint 5 "The Design of Instruction."

The basic steps involved in this effort include: 1) analyzing the characteristics of subject matter competence; 2) diagnosing pre-instructional behavior; 3) carrying out the instructional process; and 4) measuring learning outcomes.

Indexed under 4, 21.

Lindvall, C.M. *Planning of Objectives, Learning Sequences and Units for IPI.* Learning Research and Development Center, University of Pittsburgh, 1968.

Develops criteria to be used in evaluating the quality of the form in which IPI objectives are stated. It is assumed that adherence to these will maximize the chance that any given objective will have the same exact meaning to all.

Indexed under 4, 21.

Lindvall, C.M. *The IPI Evaluation Program.* Unpublished paper, Learning Research and Development Center, University of Pittsburgh, December 1968. (Paper presented at the annual meeting of the American Association for the Advancement of Science, Dallas, December 1968.)

The paper discusses the formative evaluation of IPI as evaluation that provides feedback for indicating areas or operations in need of improvement. It includes examples of data collection, such as ACC reports of math dispersion; achievement by grade level on the ITBS; and dispersion of Oakleaf students in reading and math.

The paper also includes a chart listing the basic components of IPI and how these should be realized in both the plan and operation of the program, and to the basic goals of the project.

Indexed under 9, 10, 11, 13, 15a, 15c.

Lindvall, C.M. *Suggested Emphases for the Development of IPI in the Next Five Years.* Learning Research and Development Center, University of Pittsburgh. December 1969.

This paper provides an introduction to Lindvall and Bolvin's "Some Suggested Goals for the Summative Evaluation of IPI." The basis for the suggestions in this paper are: (1) what has been accomplished with IPI is substantial; (2) change in IPI should be evolutionary, not revolutionary; (3) an individualized system must be a "structured system" to be widely adapted; (4) desired learning goals must be translated into activities that are a carefully planned part of the system; and (5) pupil learning goals can be achieved from the lesson content and by his experiences in the IPI 'system'.

Indexed under 4, 6a, 9.

Lindvall, C.M. and Bolvin, J.O. *Individually Prescribed Instruction: The Oakleaf Project.* Working Paper 8, Learning Research and Development Center, University of Pittsburgh, February 1966.

This is a general descriptive report on Oakleaf IPI which includes assumptions underlying IPI, a brief description of instructional materials and procedures, purposes of the project, and some questions to guide the evaluation of the project.

Indexed under 4, 6a, 9, 10, 11, 12.

Lindvall, C.M. and Bolvin, J.O. *Programmed Instruction in the Schools: An Application of Programming Principles in Individually Prescribed Instruction.* Programmed Instruction, Sisty-sixth Yearbook of the National Society for the Study of Education, Part II, University of Chicago Press, Chicago, 1967, pp. 217-254. Reprint 16, Learning Research and Development Center, University of Pittsburgh, 1967.

Principles for programming of instructional material are cutlined and their use in the development of IPI described. Analogies between IPI and "programmed instruction" are drawn and IPI is presented as an example of how programming principles may be used in the schools without completely adopting programmed instruction.

Indexed under 6a, 6b.

Lindvall, C.M. and Bolvin, J.O. *The Preparation of Teachers for Individually Prescribed Instruction.* Unpublished paper, Learning Research and Development Center, University of Pittsburgh, February 1968. (Paper presented at the annual meeting of the American Educational Research Association, Chicago, February 1968.)

This paper represents a rationale of how teachers should be retrained for IPI. It relates some of the procedures used at an IPI summer workshop and procedures which might be used for in-service planning sessions.

Indexed under 4, 18c.

Lindvall, C.M. and Bolvin, John O. *Some Suggested Goals of the Summative Evaluation of IPI.* Learning Research and Development Center, University of Pittsburgh, November 1969.

This paper begins with the overall goal of IPI and identifies the competencies, attitudes, and other characteristics that a pupil should acquire from his experience in an IPI school. The affective goals include: (1) the pupil will have the attitudes and outlooks associated with the likelihood of his being an effective participant in meaningful learning throughout his life, and (2) the pupil will have an appreciation for the worth, the needs, and the rights of others. The cognitize goals are organized under: (1) those abilities which are the results of participation in the IPI system, and (2) those goals that are acquired as a result of study in IPI curriculum content areas. Under each major goal are the operational behaviors a student must perform.

Suggested additional topics and areas for IPI math include math inquiry and applications, self-direction and self-evaluation, pupil interaction experiences and study skill competencies.

Indexed under 4, 6a, 9, 15, 16.

Lindvall, C.M. and Bolvin, John O. *The Role of the Teacher in Individually Prescribed Instruction.* Educational Technology, 1970.

The teacher in IPI is described in terms of three major functions: 1) operating the system, that is making the basic elements of the program, e.g. the diagnostic instruments, work; 2) supplementing the system to enhance adaptation to individual needs, that is adjusting to individual differences; and 3) providing for the achievement of goals possible only with teacher attention.

Indexed under 4, 18a, 18b.

Lindvall, C.M. and Cox, Richard C. *Some Notes on the Rationale and Plan for the Evaluation of the Individually Prescribed Project in the Development and Replication of IPI.* Address delivered at the annual meeting of the American Educational Research Association, 1967.

Cites six elements considered in the IPI evaluation plans and examples of procedures used and documents produced about each. The six major elements are: 1) the program plan; 2) the operating program; 3) the school context, 4) pupil behavior, including achievement measures; 5) teacher behavior; and 6) unplanned influences.

Indexed under 4, 9, 15a, 15b, 15c, 16b, 17, 18a, 18b.

Lindvall, C.M. and Cox, R.C. (with the collaboration of Bolvin, J.O.). *Evaluation as a Tool in Curriculum Development: The IPI Evaluation Program.* Unpublished draft, Learning Research and Development Center, University of Pittsburgh, July 1968.

This paper provides rationale for and description of the testing and evaluation programs for IPI at the Learning Research and Development Center. It is a draft of a paper to be published in the American Educational Research Association Monograph Series on Curriculum Evaluation.

Indexed under 4, 6a, 7b, 9.

Lindvall, C.M. and Cox, R.C. *The Role of Evaluation in Programs for Individualized Instruction.* Educational Evaluation: New Roles, New Means, Sixty-eighth Yearbook of the National Society for the Study of Education. University of Chicago Press, Chicago, 1969.

Evaluation is defined as 1) a procedure for gathering pupil data to use in planning and monitoring individual programs; and 2) as a procedure for gathering and analyzing data in such a way that it leads to improvements in materials and in the instructional system.

IPI objectives and tests are discussed, along with other individualized learning programs, from Winnetka Plan (1925) to the Bucknell University Progress Plan, and AIR–Westinghouse Project Plan.

Indexed under 6a, 6b, 7b, 9, 15a, 15b.

Lindvall, C.M. and Nitko, Anthony. *Criterion-Referenced Testing and the Individualization of Instruction.* Unpublished paper, Learning Research and Development Center, University of Pittsburgh, October 1968.

Discusses the need for criterion (or content) referenced tests as opposed to norm-referenced tests to determine what specific things a pupil does or does not know. The author provides a rationale for the derivation of criterion-referenced and norm-referenced tests, criterion-referenced information and criterion-referenced scores. It is the criterion-referenced information that is essential for instructional planning. IPI math is cited as an example of the use of criterion-referenced testing.

Indexed under 4, 7a, 7b.

Lindvall, C.M. and Nitko, Anthony. *Criterion-Referenced Testing and the Individualization of Instruction.* University of Pittsburgh, 1969.

IPI pre-tests which are criterion-referenced tests and yield criterion-referenced information. This information tells the teacher what pupils can and cannot do in skills within the unit. It provides a general picture of how IPI has attempted to employ criterion-referenced testing to make individualized instruction possible.

Indexed under 4, 7a, 7b.

Lindvall, C. M. and Yeager, J. S. *An Exploratory Investigation of Selected Measures of Rate of Learning.* Paper presented at the annual meeting at the American Educational Research Association, Chicago, February 1966. Reprinted as Working Paper 3, Learning Research and Development Center, University of Pittsburgh, February 1966.

In this study, the usefulness of three different measures of rate of learning in IPI were investigated, and some hypothetical correlates of rate were tested. The three rate measures were: 1) units per year; 2) days worked in specific units; and 3) content mastered per day in specific units. Correlations were made between math rate and reading rate, between rate and IQ, and between rates in two different units.

Indexed under 4, 8, 10, 11, 13, 15a, 15b,

Lipson, Joseph I. *Transfer and Generalization in Individually Prescribed Instruction.* Paper presented at the annual meeting of the American Educational Research Association, Chicago, February 1966. Reprinted as Working Paper 5, Learning Research and Development Center, University of Pittsburgh, February 1966.

This paper defines the terms "generalization" and "transfer" and presents a model for identifying instances of transfer in IPI. Tables and graphs are presented showing the frequency of occurrence of transfer instances identified by the model in each grade and in each unit of the IPI curriculum. The data is suggested as an aid to help lesson writers revise the curriculum objectives and materials to promote transfer and generalization.

Indexed under 4, 8, 10, 13, 15b.

Lipson, Joseph I. *An Individualized Science Laboratory.* Science and Children, 4:4, December 1966. Reprint No. 17, Learning Research and Development Center, University of Pittsburgh, 1966.

This article is an illustrated description of the Oakleaf science program with some rationale throughout and a sample lesson script included.

Indexed under 4, 6a, 12, 13.

Lipson, Joseph I. *Individualized Instruction in Elementary Mathematics.* Research in Mathematics Education, National Council of Teachers of Mathematics, Washington, D.C., 1967. Reprint 22, Learning Research and Development Center, University of Pittsburgh, 1967.

A paper summarizing IPI objectives, materials, instructional procedures, achievement measures (standardized tests, number of units mastered, range of achievement, summer retention, rate and I.Q. correlation, and transfer), student motivation and implications.

Indexed under 4, 7b, 10, 13, 15a, 15b, 15c, 16a, 17, 19a.

Lipson, Joseph I. *Individualization of Science Instruction in the Elementary School Laboratory.* Draft of a speech delivered at the annual meeting of the National Science Teachers Association, Detroit, March 1967. Learning Research and Development Center, University of Pittsburgh, 1967.

A descriptive paper dealing with: a typical science class at Oakleaf, objectives of the program, a description of the aims of education, and the place of science in the curriculum, LRDC programs in individualization, and evaluative efforts.

Indexed under 4, 6a, 6b, 12, 13, 17, 18a, 18b.

Lipson, Joseph I. *A Suggested Approach to the Elementary School Science Curriculum.* Working Paper 43, Learning Research and Development Center, University of Pittsburgh, May 1968.

Activities in the elementary school science should balance between relationships among verbal learning, laboratory experience, experiences in school, outside formal instruction, self-chosen activity and activity required by adult world. Stories of science, vocabulary of science and application of science should be included in content. A library laboratory for investigations dictated by self-choosing is a most.

Indexed under 4, 6b, 12.

Lipson, J.I., Cohen, H.B. and Glaser, R. *The Development of an Elementary School Mathematics Curriculum for Individualized Instruction.* Working Paper 7, Learning Research and Development Center, University of Pittsburgh, 1966.

A description of the first IPI math curriculum and a discussion of the rationale for its development is presented and supported by related literature.

Indexed under 4, 6a, 10, 13.

Loykovick, Joan and Lee, Kenneth. *The Effectiveness of the IPI Math Program at Greendale as Measured by the CAT.* Devon, Pa., 1969.

The study was conducted to determine the effectiveness of IPI Math at the Devereux Greendale Tutorial School. Student improvement in Math as measured by the California Achievement Tests during the year preceeding the institution of IPI was compared with the same students improvement during a year of IPI. Less mean improvement was measured during the year of IPI, than during the year of regular Math instruction, but the final mean discrepancy was statistically insignificant. Due to the lack of an adequate control group, possible differences in the average improvement rate from year to year were not controlled.

Indexed under 10, 14, 15c, 20.

Magoon, Jon and Cox, R.C. *The Principal Component Structure of Multiple Guttman Scales.* Paper delivered at a joint session of the National Council on Measurement in Education and the American Educational Research Association, Chicago, Illinois, February 1968. Reprinted as Working Paper 41, Learning Research and Development Center, University of Pittsburgh, 1968.

This study compares the results of applying two different analysis procedures to theoretical test data—one is the metric technique of factor analysis, the other the non-metric multiple scalogram analysis. It was found that under certain conditions of score distribution, reproducibility, and independence of scales, the Guttman scales could be represented by single principal components. Results may be significant for criterion-reference testing.

Indexed under 4, 7a.

Miller, George (with collaboration of Research for Better Schools, Inc., and Oakleaf Elementary School Teachers). *IPI Mathematics Unit Manual: Levels C-G, Numeration through Fractions. 1969.*

This tryout manual provides Unit Descriptions, Objective Sequence Charts, and Objective Study Guides. Intended for use by students, it can aid anyone in making appropriate prescriptions. The Unit Descriptions tell "What" and "Why" the content of the unit is studied and gives examples. The Sequence Chart shows logical alternative paths for mastering the objectives of the unit. The Objective Study Guide explains the objective, tells the purpose of the objective, identifies critical prerequisite objectives, and lists suggested prescriptions which are correlated with pretest score ranges. References to extra-system learning aids are also included.

Indexed under 4, 5, 10, 13, 17, 18a, 21.

Moshy, Claire A. *Teaching in IPI (A Program of Teacher Preparation).* Research for Better Schools, Inc., 1968.

Training package was developed to enable administrators to train their own staffs. The materials are logically sequenced and auto-instructional. Teaching in IPI serves as an introductory program to IPI; it was designed to equip the teacher with the minimal skills needed to plan and conduct IPI in the classroom.

Volume I: an overview of individualized instruction and IPI; the behavioral objectives and IPI Math Continuum.
Volume II: diagnosis of student achievement (the IPI tests).
Voluem III: developing a prescription.
Volume IV: case studies.
Volume V: case studies.

Indexed under 5, 6a, 6b, 7b, 10, 18a, 18b, 18c, 21.

Nitko, Anthony, J. *Measurement of Instructional Outcome vs. Measurement for Instruction: A View of IPI Testing Procedures.* Unpublished draft, Learning Research and Development Center, University of Pittsburgh, September 1968.

A review of IPI testing procedures in an effort to integrate these into a model of individualized instruction. An assumption is made that these measurements are a part of the instructional program itself; and as such have implications for immediate teaching and learning. Implications for changing the testing program of IPI are stated.

Indexed under 4, 7b.

Nitko, Anthony J. *A Description of the Individually Prescribed Instruction Project.* In Hofstetter, Arthur N. (Ed.) Leadership for Curriculum Development. Seminar and Conference Reports and Proceedings Series. Vol. 1, No. 1 pp. 19-27. November, 1969.

Included in the description of IPI is the decision-making role of the teachers which include the placement of the individual, diagnostic decisions, monitoring decisions and the evaluation of the desired outcomes of the particular instruction.

Indexed under 4, 6a, 7b, 13, 18a, 18b.

O'Keefe, Kathleen. *Use of Placement Tests in IPI Math.* Unpublished paper, Learning Research and Development Center, University of Pittsburgh, July 1968.

An experiment using revised placement procedures (new policy for starting pupils on work using old placement tests and testing procedures) is described. The new policy seems to show promise for helping pupils proceed through the curriculum with less time spent studying units previously mastered.

Indexed under 4, 7b, 10, 13, 15b, 17.

P.E.P. Has a First. Pep Journal, Vol. 20, No. 1, pp. 13-16. Fall, 1970.

Report on Summer Workshop on Individualized Education at Pennsylvania State University co-sponsored by RBS. Two week sessions included work on behavioral objectives, innovations in individualization, and staff preparation.

Indexed under 5, 6a, 6b, 18a, 18b, 18c.

Radi, Stephen. *Results of Stanford Achievement Tests at Parker Elementary School.* Clarence, New York, June 1970.

The Stanford Achievement Test was administered to the pupils in arithmetic computation and arithmetic concepts in September 1969 and April 1970. Using the test to determine the same difference between pre and post test scores, the difference was found to be statistically significant at the .001 level of confidence.

Indexed under 10, 14, 15c.

Research for Better Schools. *Preliminary Report, IPI Institute.* Summer 1966.

Plans for the 1966 IPI Summer Institute for training school personnel are presented in detail.

Indexed under 5, 6a, 18c.

Research for Better Schools, Inc. *Degree of Implementation of Individually Prescribed Instruction, National Summary Reports: Fall 1968, Spring 1969, and Comparison 1968-69.*

Reports present results of analysis of prescriptions obtained from teachers in (80) IPI schools. The criteria for correct understanding of IPI procedures include the correct use of Placement Tests (Fall only), of pretests, post-tests, CET scores, and variability of prescriptions.

Indexed under 5, 7b, 9, 10, 14, 17, 18a.

Research for Better Schools, Inc. *Individually Prescribed Instruction Application.* January 1968.

The application includes a cover letter citing the five specific criteria for the selection of new IPI schools.
Part I: basic information
Part II: knowledge of the IPI system (to be completed by the Superintendent of Schools)
Part III: knowledge of the IPI system (to be completed by the Principal)

Indexed under 5, 14, 19b.

Research for Better Schools, Inc. *Annual Reports of the Corporation.* April 1966, September 1966, September 1967, September 1968, eptember 1969, September 1970.

Selected sections of these reports constitute basic policies adopted by the RBS Board as related to IPI. In addition, major IPI events and accomplishments are included as well as descriptions of the system over the past several years.

Indexed under 5, 6a, 6b, 9, 13, 14, 22a, 22b.

Research for Better Schools, Inc. *Basic Program Plans.* September 1968.

The plans describe the complete Individualized Learning Program including an overview, program rationale, program description, expected outcomes, and projected work schedules. The plan is updated every year depending upon funding and previous year work experiences.

Indexed under 5, 6a.

Research for Better Schools, Inc. *Degree of Implementation of Individually Prescribed Instruction, Guide for the Interpretation of Results.* Fall 1968.

Paper discusses the specific criteria used in determining the degree of implementation for each teacher and school in the 100 school program.

Indexed under 5, 7b, 9, 10, 14, 17, 18a.

Research for Better Schools, Inc. *IPI Evaluation Summary 1967-68: Status Report.* November 1968.

A report is given on the results of a multiple analysis of variance involving data on IPI and control pupils on such variables as: IPI math pre and post placement scores; ITBS scores; non-verbal IQ; attitude information from the NLSMA Student Inventory and a "Five Faces" instrument; and teacher information from a classroom interaction analysis. Results are reported in the areas of pupil achievement, individualization, side effects, and teacher effects.

Indexed under 5, 9, 10, 13, 14, 15a, 15b, 15c, 15d, 16a, 17, 18b, 20.

Research for Better Schools, Inc. *Administrative Training Program for IPI Mathematics.* 1969.

The purpose of the Administrative Training Program (ATP) is to provide new IPI administrators with the necessary information and materials for the successful implementation of the IPI Math program in their schools. The materials described below are used in conjunction with on-site training at an existing IPI school.

Emphasis centered on the role of the principal as the instructional leader of the IPI program in his school. The contents of the training package include:

1. Information about the ATP and evaluation forms
2. Discussion of Teaching in IPI (teacher training program)
3. Administering in IPI
4. Aiding IPI (including materials ordering procedures, training of professional and paraprofessional staff)
5. Evaluating IPI (appraisal activities for 1969-1970)
6. IPI reference bibliography

Indexed under 5, 10, 18a, 18c, 19a, 19b.

Research for Better Schools, Inc. *IPI Evaluation Summary 1968-1969.*

RBS data collection activities for 1968-69 are compiled and summarized in seven basic sections: achievement, formative math, formative reading, temporal retention, teacher attitudes, pupil attitudes, productive thinking. A description of instruments used, school involvement, and data processing are included.

Indexed under 5, 7b, 8, 9, 10, 11, 14, 15a, 15b, 15c, 15d, 16a, 16b, 20.

Research for Better Schools, Inc. *Individually Prescribed Instruction.* 1969.

A descriptive brochure which includes a brief hisotry of individualization; the background of IPI, its distinguishing features and diagnostic instruments. The role of RBS in disseminating, training, and evaluating is discussed. The math and reading curricula are described. General questions visitors ask and answers for them are given.

Indexed under 4, 5, 6a, 7b, 10, 11, 21.

Research for Better Schools, Inc. *Individually Prescribed Instruction Mathematics (IPI) Application for Individual School Participation.* 1969.

The revised application includes a cover letter citing the five specific criteria for the selection of new IPI schools and three separate parts covering different aspects:
Part I: (to be completed by the Superintendent of Schools): Basic System Data
Part II: (to be completed by the Superintendent of Schools): Administrative Commitment
Part III: (to be completed by the Principal of the School): Administrative Commitment.

Indexed under 5, 14, 19b.

Research for Better Schools, Inc. *Expansion IPI Mathematics.* March 1969.

Considerations critical to RBS in making the decision to expand the IPI program in math for the school year 1969-70 included a build-up of interest and momentum with part of public schools, reduction of cost and the need for a field test on a new population. Information on the application for schools, administration and teacher training and degree of implementation is included.

Indexed under 5, 10, 14, 18c, 19b.

Research for Better Schools. *Administrative Training Program for IPI Mathematics.* 1969.

The manual of materials used to train administrators in their IPI math roles contains: Basic ATP Information, Teaching IPI, Aiding IPI, Administering IPI, Evaluating IPI, and IPI Bibliography.

Indexed under 5, 10, 14, 19b.

Research for Better Schools, Inc. *A Progress Report: Individually Prescribed Instruction.* August, 1969.

Part I: Progress and Findings to Date: dissemination model; studies of pupil achievement and attitude, teacher attitude and changes, administrators, developmental efforts.
Part II: Formative and Interim Summative Evaluation: Chart format of all related studies, which includes the author, title, date, population, instruments used, description of the study, and results.
Part III: Annotated Bibliography: major writings about IPI, almost all of which are post-1966.

Indexed under 5, 9, all references.

Research for Better Schools, Inc. *Data Comparison School Pair 1* September 1969.

Results show that 1) on IPI Mathematics Placement Tests, IPI pupils scored as high or higher than control pupils. 2) On the Iowa Test of Basic Skills, there were no differences between schools. 3) On the Pupil Opinionnaire, IPI pupils have a more positive attitude toward school in general and toward the subject of mathematics in particular. 4) Based on the Degree of Implementation, the teachers of IPI have done a good job in implementing IPI. 5) Based on a teacher questionnaire the teachers express an enthusiastic and favorable attitude toward teaching in an IPI school.

Indexed under 5, 10, 14, 15b, 15c, 16a, 16b, 18a, 20.

Research for Better Schools, Inc. *Data Comparison School Pair 2,* September, 1969.

Results show that: 1) IPI pupils, especially at the sixth grade level, scored as high or higher than control students on both the IPI Placement tests and on the math and reading subjects of the Iowa Test of Basic Skills; 2) IPI pupils have a more positive attitude toward school in general and toward the subject of mathematics in particular; 3) on the Degree of Implementation, the teachers showed they did well in implementing IPI principles and practices; and 4) on a teacher questionnaire, the IPI teachers express a generally favorable attitude toward teaching in an IPI school.

Indexed under 5, 10, 14, 15b, 15c, 16a, 16b, 18a, 20.

Research for Better Schools, Inc. *Data Comparison School Pair 3,* Spetember, 1969.

Results show that: 1) IPI pupils score higher on the IPI Placement Tests; 2) Control pupils score higher on the Iowa Test of Basic Skills subtests; 3) IPI teachers scored very high on the Degree of Implementation of the Program; 4) IPI pupils have a positive attitude toward IPI math.

Indexed under 5, 10, 14, 15b, 15c, 16a, 16b, 18a, 20.

Research for Better Schools, Inc. *Data Comparison School Pair 4,* August, 1969.

Results show a difference in IQ based in the Lorge Thorndike Intelligence Test with the control pupils significantly higher and this difference was disp ayed by the control pupils scoring higher on the IPI Placement Tests and the Iowa Test of Basic Skills.

IPI Teaching staff and pupils are very positive in their attitude toward IPI. The teachers have done a fine job of implementing the practices and principles of IPI.

Indexed under 5, 10, 14, 15b, 15c, 16a, 16b, 18a, 20.

Research for Better Schools, Inc. *Data Comparison School Pair 5,* August, 1969.

Results include: 1) On the IPI Mathematics Placement Tests, IPI pupils score higher than control pupils; 2) on the Iowa Test of Basic Skills, IPI pupils score higher than control pupils on arithmetic and reading subtests; 3) IPI pupil attitudes toward school are more positive than control students; and 4) IPI teachers display enthusiasm for and capability in handling the IPI program.

Indexed under 5, 10, 14, 15b, 15c, 16a, 16b, 20.

Research for Better Schools. *Minicourse 5: Effective Tutoring in IPI,* 1969.

The handbook for the operational version of Minicourse 5. A field test was conducted at an RBS/IPI demonstration school and this handbook contains all lesson materials, evaluation forms and the VTR systems guide.

Indexed under 5, 10, 18b.

Research for Better Schools. *Teaching in IPI Mathematics, Volumes 1-6* (A Program of Teacher Preparation), 1969.

A self-instructional set of teacher training materials in IPI mathematics containing self-diagnostic instruments and programmed practice materials in the areas of:
1. Individualized Instruction and IPI
2. Behavioral Objectives and the IPI Math Continuum
3. Diagnosis of student achievement
4. Developing a Prescription (Case study 1)
5. Developing a Prescription (Cast study 2)
6. Developing a Prescription (Case studies 3-4-5)

Indexed under 5, 10, 14, 18a, 18b, 18c.

Research for Better Schools, Inc. *Individualized Learning Program Social Studies Project: Social Encounter and Research Curriculum for Humanization Rationale Synopsis.* November 1970.

Description of SEARCH including assumptions, goals, content and scope sequence learning strategies and parallel teaching strategies, media evaluation and theoretical and conceptual foundations. An annotated listing of the project's working paper is included.

Indexed under 5, 7b, 8, 9, 17, 18, 26.

Research for Better Schools, Inc. and Learning Research and Development Center, University of Pittsburgh. *Summary of a Conference of Teachers and Administrators Using the Instructional System, Individually Prescribed Instruction.* February 1967.

The objectives of the conference were: 1) to encourage teachers and administrators to define and list their functions in IPI; 2) to elicit what preparation they had to prepare them for these functions; 3) to determine what preparation is needed by teachers and administrators to be involved in IPI;

and 4) to discuss problems of interaction between teacher -student, teacher-aide, and teacher-administrator. Teachers and administrators completed questionnaires covering the evaluation of various aspects of the IPI program and of the conference itself.

Indexed under 4, 5, 9, 13, 16b, 18a, 18b, 19a, 19b, 19c, 19d.

Research for Better Schools, Inc. and Learning Research and Development Center. *Summary of a Conference of Teachers and Administrators Using the Instructional System Individually Prescribed Instruction.* March 1968.

This report includes discussions on the problems in and recommendations for improving mathematics and reading seminars, planning sessions, prescription-writing, reading and mathematics programs, classroom activities, training. Other topics included teacher evaluation, reporting progress, special learning problems and characteristics, creative adaptations, public relations and evaluation of the workshop sessions.

Indexed under 4, 5, 10, 11, 17, 18b, 18c, 19a, 19b.

Resnick, Lauren B. *Design of an Early Learning Curriculum.* Working Paper 16, Learning Research and Development Center, University of Pittsburgh. December 1967.

This paper describes the rationale and procedure for designing a curriculum for children three to six years old in the Pittsburgh Primary Education Project (PEP). The curriculum is to develop "the skills and concepts that underlie intelligent [learning] behavior." Hierarchial sequences of behavioral objectives are derived by component analysis and may be used either in class-oriented or individualized programs. Currently, its use is being tested in an individualized setting.

Indexed under 4, 6b.

Russo, Lillian N. *S.E.A.R.C.H. Conceptual Framework to Date.* Research for Better Schools, Inc., April 1969.

Outline and memos regarding plans, organization, administration and production of S.E.A.R.C.H. are included. Areas of consideration are administration, resources, research, development, coordinator and communication.

Indexed under 5, 6a, 19d, 26.

Russo, Lillian N. *S.E.A.R.C.H. Perspectives (Social Concepts and Research Curriculum for Humanizing.)* Research for Better Schools, Inc., July 1969.

Draft of a rationale for the development of a new social studies curriculum in which the individual is considered an end in himself. A variety of related philosophical, psychological, and pedagogical concepts are outlined.

Indexed under 5, 6a, 26.

Sandvick, Ellen. *An Evaluation of IPI (Math) Procedures. Carman School 1968-1970.* Waukegan City School District 61, Illinois, 1970.

Carman School and 29 IPI math students in 7th grade who had IPI as 6th graders were compared with a control group in: 1) student achievement ad demonstrated on the Standard Achievement Test; 2) teachers' attitudes about IPI and individualization of instruction; 3) pupils' opinions regarding school and mathematics in particular. In addition parent attitudes about IPI were studied.

Results include: 1) comparisons of IPI and control in gains and range of arithmetic scores computation, arithmetic concepts and arithmetic applications; 2) IPI teachers are more accepting of individualization reflecting a greater degree of acceptance of innovation; 3) in elementary school all pupils like school, choose math as their favorite subject, but IPI apparently enhances the self-concept of the child. However, in the junior high comparison more control pupils like school than IPI pupils; 4) Parents feel their children are showing progress in IPI math and indicate their children have discussed IPI at home.

Indexed under 10, 14, 15c, 16a, 16b.

Scandura, Joseph M. and Satlow, Gerald. *An Analysis of Existing Curricular Materials in Mathematics Phase One (K-6).* Research for Better Schools, Inc., 1968.

An examination of ten widely used mathematics text series, including their objectives; the degree of correspondence between the objectives and the materials; evaluations of mathematics materials by publishers and authors; a summary of in-depth analysis of each series; conclusion and recommendations.

Indexed under 5, 10.

Scanlon, Robert G. *Factors Associated with a Program for Encouraging Self-Initiated Activities by Fifth and Sixth Grade Students in a Selected Elementary School Emphasizing Individualized Instruction.* Unpublished doctoral dissertation, University of Pittsburgh, 1966.

The study included the use of three treatments in the math classes: 1) was designed to create awareness and use of a wide range of supplementary materials; 2) provided opportunities to explore special interest areas; and 3) was designed to capitalize on special interests and to structure opportunities for teachers and students to praise exceptional work. The treatments, introduced one per month, continued throughout the four-month research study. Three instruments were used to measure: 1) self-initiated behavior; 2) student interest; and 3) peer-group evaluation of initiation.

The major findings were that self-initiation can be improved by providing special techniques during class period, that there is little relation between self-initiation and I.Q., achievement or sex of student.

Indexed under 13, 16a, 17, 18b.

Scanlon, Robert G. *Oakleaf School: A Model for Individually Prescribed Instruction.* Paper presented at the Conference on Educational Innovations, Miami, June 1966.

The paper gives an overview of IPI at the Oakleaf School. The topics covered include: 1) background of the project; 2) development of behavioral objectives for the curriculum areas; 3) development of diagnostic instruments; 4) development of materials; 5) prescription writing; and 6) administering and scheduling of IPI. The final section, Conclusions, deals with research and evaluation questions.

Indexed under 4, 6a, 7b, 9, 13, 17, 18a, 18b, 18c, 19a, 19b, 21.

Scanlon, Robert G. *History of Individualized Instruction.* Education in Ferment: Presentations from the 1967 Fifteenth Annual Workshop, State Federation of the District Boards of Education of New Jersey, Atlantic City, October 1967.

A general description of IPI as initiated by the Learning Research and Development Center and Research for Better Schools' dissemination and evaluation of IPI.

Indexed under 6a.

Scanlon, Robert G. *Innovation Dissemination.* Pennsylvania School Journal, 116:7, March 1968.

A description of how RBS is disseminating and testing IPI.

Indexed under 5, 6a, 14.

Scanlon, Robert G. *The Expansion of an Innovation.* Audiovisual Instruction, November 1968.

Article discusses the administrative implementation of IPI terms of: 1) selection of new schools, 2) retraining of administrators and teachers, and 3) systematic data collection to permit immediate improvements in the program.

Indexed under 5, 6a, 9, 14, 18a, 18c, 19b.

Scanlon, Robert G. *The Use of Data in School Selection and Training of Administrators and Teachers.* (Prepared for Meetings of the American Educational Research Association, Los Angeles, California, February 1969.)

Paper discusses two phases of the controlled expansion of IPI. Phase 1 includes the background for the development of the training materials and the instruments for their evaluation. Case studies of the two schools in which the materials were first field-tested are given. There is a discussion of the specific criteria for the selection of new IPI schools, as developed according to the results of the field-testing.

Phase 2 discusses the retraining of administrators to enable them to train their staffs, the development of specific administrator training programs and copies of the instruments used to evaluate these.

Indexed under 5, 18c, 19b.

Scanlon, Robert G. *A Summary of Training Activities IPI, June 1966-January 1968.* Research for Better Schools, Inc., 1969.

A description of teacher institutes, as well as the development of training materials and strategies used with IPI teachers and administrators.

Indexed under 4, 5, 18c.

Scanlon, Robert G. *An Innovative Practice in Individualized Instruction.* Paper presented at Northern Illinois University, DeKalb, Illinois, July, 1969.

The historical review of IPI, RBS and Demonstration Schools includes a description of the expansion strategy, including the criteria for commitment to the program, the Administrative Training Program, teacher retraining and the data network and feedback system (including Degree of Implementation and Planning Session reports).

Indexed under 5, 6a, 9, 14.

Scanlon, Robert G. *Bibliography of Individualization.* Research for Better Schools. 1969.

This complete Bibliography includes sections on books, periodicals and book articles; pamphlets, papers and reports; microfiche, unpublished papers and reports from the Learning Research and Development Center and Research for Better Schools; and films.

Indexed under 5, all references.

Scanlon, Robert G. *Individually Prescribed Instruction: A System of Individualized Instruction. Educational Technology.* December 1970.

The developmental model of IPI is detailed including personnel roles and special characteristics of the IPI system. Historically, the development of IPI by LRDC and the dispersion by RBS are described including a description of the five pilot schools, training procedures and degree of implementation of the field test schools.

Indexed under 5, 6a, 13, 14, 18c, 19b.

Scanlon, Robert G., et. al. *A Manual for the IPI Institute.* Learning Research and Development Center, University of Pittsburgh and Research for Better Schools, Inc., June 1966.

A manual used in the training of teachers and administrators at the 1966 IPI Summer Institute in Pittsburgh. It includes a rationale of a system of individually prescribed instruction, as well as detailed explanations of the procedures and practices involved in the program.

Indexed under 4, 5, 18c.

Scanlon, Robert G. and Brown, Mary V. *Inservice Education for Individualized Instruction. Educational Technology.* February 1970.

RBS' training programs for IPI from 1966 are described. Based on these experiences, the goals of training (enabling the school to conduct its own training enabling the teachers to conceptualize a model of individualized instruction and enabling the teachers to plan and conduct IPI) were established and the decision was made to train the school principal and have him assume the responsibility for retraining his staff. The Administration Training Program enables the school leaders to learn the IPI system and generally help in the three areas of organization, communication and analysis of data. The teacher training and continuous training programs are also described.

Indexed under 5, 14, 18c, 19b.

Scanlon, R. and Moshy, Claire. *Teacher Education for Individualized Instruction.* Research for Better Schools, Inc., 1968. (Paper presented at meeting of the Pennsylvania Education Research Association, University of Pittsburgh, November 1967.)

The evaluation of IPI teacher training or retraining from 1966 through 1967 is described. Cooperation between RBS and some selected colleges of teacher education are included.

Indexed under 5, 6a, 18c.

Scharf, E. *Implementation of Individually Prescribed Instruction: Summary of Problem Areas, Fall 1966, Spring 1968 and Possible Solutions.* Research for Better Schools, Inc., 1968.

Summary of specific problem areas as desrived from case histories of IPI in four demonstration schools (Downey, Richland, West, & Washington). Subjects covered include: materials (organization, shortage and inadequacy of); personnel (training and need for role definition); scheduling; prescription writing; planning sessions; seminars; classroom activities; visitors; and RBS-School relations.

Indexed under 5, 6a, 10, 14, 17, 18a, 18b, 18c, 19a, 19b, 19d.

Scharf, E. *Summary of Prescription Analysis Feedback, 1967-68.* Research for Better Schools, Inc., 1968.

The introduction cites the factors considered by RBS resource personnel in evaluating math prescriptions over a three month period for teachers at Richland, Washington, West, and Friends (Wilmington) Schools. Tables presenting the data are included, along with brief summary statements on teacher and school improvement in the various factors. The types of feedback forms used by the resource persons are also included in the report.

Indexed under 5, 10, 14, 18a.

Scharf, Eugenia. *Case Histories of Four IPI Schools*, Research for Better Schools, Inc. 1969-70.

Description of the processes and problems involved in the implementation of the IPI program during its first two years. Broad areas covered were: personnel problems and practices, classroom activities and problems, prescription writing problems and practices, and materials.

Indexed under 5, 14, 17, 18a, 18b, 18c, 19a, 19d.

Scharf, Eugenia. *1970 Pupil Attitude Study*. Research for Better Schools, Inc., December, 1970.

The Semantic Differential Technique was to measure attitudes toward generalized concepts (e.g., school, class), mathematics, reading, spelling, and handwriting in comparing elementary pupils in 6 IPI and 6 control schools, grades 3-6. Eighteen concepts were measured on nine scales. Results show that for school pair 1, most of the significant differences were in favor of the control school (it was a difficult year for the IPI school due to the principal's death, a struggle for that position and a teacher's strike); for school pair 2, almost all the significant differences were in favor of the IPI school; for school pair 3, IPI pupils scored more positively and negatively than control pupils; for school pair 4, there were few differences between IPI and control; for school pair 5, there were few significant differences; and for school pair 6 there were more significant differences for the control school.

Indexed under

Scharf, Eugenia. *Teacher Attitudes: Harrisburg—April 1970*. Research for Better Schools, Inc. 1970.

Description of the results obtained on the Purdue Teacher Opinionnaire by teachers at the Harrisburg IPI and Control Schools. Summary of structured interviews held with all teachers at the two schools.

Indexed under 5, 14, 16b, 20.

Scharf, Eugenia. *Teacher Attitude Study: Spring 1970. The Effect of IPI Upon Job Satisfaction*. Research for Better Schools, Inc., 1970.

A standardized test, the Purdue Teacher Opinionnaire, was employed to determine if teachers in the six IPI Demonstration schools display a more positive attitude toward teaching than do teachers in the six paired Control Schools. Ten major factors were analyzed. The data showed: 1) IPI teachers are significantly more positive toward Curriculum issues than are Control teachers; 2) IPI teachers do not object to the extra effort involved in individualizing instruction; and 3) the IPI program seems to effect the greatest change in the attitude of inner-city school teachers.

Indexed under 5, 16b, 20.

Schmidt, Ethel. *The Relationship fo Rhythmic Ability to Spelling Achievement: Report of a Pilot Study at McAnnulty School 1968-1969*. Research for Better Schools, Inc. July, 1970.

IPI Spelling Placement Tests were used to identify high and low achievers in spelling. Group tests of mental ability (Otis-Lenon, and Lorge Thorndike) were used to establish I.Q. The rhythm section of the Seashore Measure of Musical Talents (1939 Revision) Series A was the criterion for determining ability to perceive, recall, and recognize rhythmic patterns. For the 324 pupils—grades 3 through 6 of this study, low rhythmic ability accompanied low spelling achievement but was not significantly correlated with I.Q.

Indexed under 5, 8, 14, 15d, 25.

Simon, Anita, Boyer, E. Gil and Buccino, Ernest. *A Comparison of Teacher-Pupil Verbal Interaction in IPI and Non-IPI Schools*. Research for Better Schools, November 1968.

The purposes of the study were to test the following hypotheses: 1) that IPI teachers do not differ significantly from non-IPI teachers in their verbal behavior on selected variables as measured by the Flanders 10 Category Interaction Analysis System; 2) that IPI pupils do not differ significantly from non-IPI pupils in their verbal behavior as measured by the Flanders System. Data for this study was collected from five IPI schools and their controls.

Results: In general, there were only small differences between IPI and non-IPI schools. The statistical differences that did show were few and in a direction opposite to what theory in this field suggests improves pupil outputs. Thus, it is reasonable to conclude that any improvements in IPI pupil outcomes over the control school pupil outcomes is not a function of the teacher verbal interaction measured by this study.

Indexed under 5, 17, 18b.

Swartz, Clifford and Appel, Marilyn (ed.) *Individualization: An Emergent Concept in Science Instruction*. A forum on individualization in science instruction (December 7, 8, 9, 1967), summary of the proceedings (sponsored by Research for Better Schools, Inc.)

The proceedings consist of an abstract of the formal papers persented during the conference. Session I was devoted to the implications of learning theory with regard to individualization of teaching. Session II was concerned with the content of science programs as well as who should determine content. Session III was spent in hearing about current practices in individualizing science instruction (the speakers included Warren Shepler and Jacqueline Cohen describing IPI in science: the Oakleaf Project.)

Indexed under 4, 5, 6a, 6b, 8, 12, 13.

Temkin, Sanford. *Problems Associated with Relating Normative and Skill Tests*. Unpublished paper, Research for Better Schools, Inc., 1967. (Paper presented at the meeting of the Pennsylvania Educational Research Association, University of Pittsburgh, November 1967.)

A description is given of a plan for relating IPI placement test and ITBS performances in a complex "micro-analysis" breaking scores and test groups down by school, grade, math area, level, and ITBS subtest, and utilizing analysis of variance and item correlations among other techniques to study relationships between placement test and ITBS scores.

Indexed under 5, 7b, 10, 11, 15b, 15c.

The Editors. *Individually Prescribed Instruction*. Education U.S.A. Special Report, 1968.

A comprehensive report covering many aspects of IPI from its origins to date. Of special interest are teacher suggestions on prescriptions to meet specific learning problems, and teacher and administrator view of IPI.

Indexed under 4, 5, 6a, 7b, 10, 11, 12, 13, 14, 15a, 15b, 15c, 16a, 16b, 16c, 17, 18a, 18b, 18c, 19a, 19b, 20, 21.

The Management of IPI Classrooms, *Learning Research and Development Center and Research for Better Schools, Inc.* July 1969.

Report includes the following materials:

1. Individually Prescribed Instruction: Some Suggestions for Teachers and Supervisors. (manual outlining desired classroom practices)

2. The IPI Classroom Management checklist (used by teachers and supervisors in studying actual practices)
3. Some common IPI classroom problems and suggestions for their solution.

Indexed under 4, 5, 17, 18a, 18b.

Tuscumbia Public School. *IPI Math 1968-69.* Tuscumbia, Alabama. 1969.

This information pamphlet gives the history of IPI Math in Tuscumbia Public Schools. Pupil and parent opinions are r[illegible] and results show highly favorable attitude toward the [illegible] program. Attendance figures are reported and the children in the IPI program showed gains in attendance.

Indexed under 14, 16a, 16c.

Unks, Nancy J. *A Plan for Evaluating the IPI Testing Program.* Unpublished paper, Research for Better Schools, Inc., 1967. (Paper presented at the meeting of the Pennsylvania Educational Research Association, University of Pittsburgh, November 1967.)

A rationale and overview of a plan for evaluating the IPI testing sub-program is presented with an outline of the plan based on Lindvall's evaluation paradigm.

Indexed under 4, 7b, 9, 19c.

Unks, Nancy J. *Individually Prescribed Instruction: A Proposed Pilot Study of Selected Intellectual Factors.* Research for Better Schools, Inc., December 1968.

Paper includes background discussion on the need for a study of creative problem solving in IPI to support or refute critical accusations; a rationale for the selection of feasible and operational measures of creativity; the experimental design for the IPI study; and a description of the six t[illegible]ts in the battery.

Indexed under 5, 8.

Unks, Nancy J. *An Investigation of Validity of Reliability Concepts for Criterion-Referenced Measurement.* Unpublished Master's Thesis, University of Pittsburgh, 1969.

A logical investigation of the applic[illegible]bility of test evaluation procedures to criterion-referenced measurement was conducted. The appropriateness of traditional procedures developed on norm-referenced tests was found to be limited by the purposes of criterion-referenced measurement in individualized instructional settings. Selective applications of these methods are recommended. Some new procedures and concepts for item analysis, validity, and reliability are suggested to supplement the older techniques and to provide test evaluation procedures which are more congruous with the aims of measurement for individualized instruction.

Indexed under 7a.

Unks, Nancy J. *Basic System Data Reports, 1967-1968.* Research for Better Schools, Inc., April 1969.

A report is given on the contents of 10 types of printouts concerning the use of IPI math materials during the 1967-68 school year. For each type of printout, the data contained within is listed and the frequency of its issue is noted (by month, once yearly, etc.). A table at the end summarizes the printouts available and describes the raw data which is also available on magnetic tapes.

Indexed under 5, 9, 10, 15b.

Unks, Nancy J. *I.P.I. Mathematics: A Report on the Results of 1967-68 Prescription Data Analysis.* Research for Better Schools, Inc., May 1969.

Prescription data based on 4,685 pupils in 19 I.P.I. schools was summarized, including such items as pages used, test scores and days spent in each skill. Printouts of the summaries yield information relating to five aspects of I.P.I.:
1. initial pupil placement
2. gross pupil progress
3. sequencing and difficulty of instructional units
4. sequencing and difficulty of skills
5. test unreliability and non-validity

Th[illegible]esults in each of these five areas were as follows:
1. [illegible]odal placement levels for each grade were determined as follows:

grade 1	level B
grade 2	level C
grade 3	level C and D
grade 4	level D
grade 5	level D and E
grade 6	level E

Percentages of pupils who could not be placed at any level decreased from grade 1 to 6.
2. Over all grades, the average number of units completed in o[illegible]e year was 12.5 (about one level).
Average units completed in a year increased from grade 1 to 6.
3. Eighteen out of 70 units are identified as easy by pretest data; 26 are difficult. Most difficult skills are identified within the problem units by average pretest scores. Twenty-five units are identified as difficult by posttest data.
Altogether 56 units are difficult by pre-test and/or posttest data or need skills resequenced.
4. Forty-eight out of 372 skills are identified as easy by pretest data; 57 by CET data.
Fourteen are difficult according to pretest data; 68 according to CET data; 32 by use of instructional techniques.
For 55 units the orders of skills from easy to difficult according to pretest data are listed.
5. Difficult units and skills are indicators of possible test non-validity or unreliability.
Thirty-three units found easy by pretest data at the beginning of the year (as opposed to only 18 later in the year) may indicate misplacement of pupils and non-validity of placement tests.

Indexed under 5, 7, 10, 15, 15a, 15b.

Unks, Nancy J. *IPI Science: Results of Item Analyses of Supplementary Tests.* Research for Better Schools, Inc., 1970.
A. Inventory of Prerequisite Skills
B. Auditory Perception Test
C. Short Vowel Embedded Sound Test

In the fall of 1969, two tests were given to all first and second grade pupils who would be participating in the IPI Science program in the six demonstration schools. The first test was the Inventory of Prerequisite Skills which contained eight subtests measuring skills a child would be required to use in the science program and thus must master before entering IPI Science. The second test was the Auditory Perception Test measuring two aspects of a pupil's ability to deal with sound stimuli. It was hypothesized to identify pupils who might have trouble in the highly sound oriented science program. In the spring of 1970, before the pupils had begun work in the science lessons, they were given the Short Vowel Embedded Sound Test. This was a taped test measuring additional auditory skills which were probably more like those required of pupils in the taped science lessons than the skills measured by the Auditory Perception Test. The Inventory of Prerequisite Skills appeared to be homogeneous from the inter-item and item-total score correlations. The Short Vowel Embedded Sound Test was the most difficult of the three tests and showed a fatigue effect in the first grade indicating that it may be too long for the younger pupils. Differences between schools were found on this test, while on the other two, school differences were negligible.

The ability of all three tests to predict performance in the science program should be studied in future analyses.

Indexed under 5, 12, 7b.

Unks, Nancy J. *A Study of IPI Spelling Prescription Data.* Research for Better Schools, Inc., July, 1970.

Children's prescriptions for work done in IPI Spelling in the six demonstration schools during the 1969-70 school year were analyzed in order to 1) determine the degree to which the procedures specified for the program had been implemented in the schools, and 2) give RBS personnel additional information which might serve as a basis for making modifications.

Results were favorable showing that most teachers adapted well to the new spelling procedures. On the pupil progress question, track one pupils pretested out of almost two-thirds of the units having to work in only six or seven per half-book. Track six pupils had to work in still fewer units but mastered only slightly more material.

Additional information was tabulated from samples of thirty prescriptions in each half-book. Data were obtained on test scores, gain scores, amount of time pupils worked in a half-book, and how many units pupils pretested out of. There were few significant differences between track one and track six pupils on these statistics, and the spelling program appeared to be easy for pupils in both tracks. The recommendation was made that perhaps most pupils could be allowed to work at a faster rate or at higher levels.

Indexed under 5, 25, 14, 17.

Unks, Nancy J. *IPI Spelling Degree of Implementation: Demonstration Schools Summary.* Research for Better Schools, Inc., May, 1970.

IPI Spelling Prescriptions were collected from the demonstration schools (10 pupils per class) for 1969-70 and analysed 1) to determine whether teachers were following the recommended procedures and 2) to determine what progress the sample pupils had made in spelling up to the beginning of May. Results showed that the spelling program has been implemented correctly.

Indexed under 5, 14, 15a, 18a, 24.

Unks, Nancy J. *Pilot Study of IPI Handwriting Prescription Data. Research for Better Schools, Inc. 1970.*

Twenty-five prescriptions in each book for work done in IPI handwriting during 1969-70 were analyzed in order to 1) give summary statistics for inclusion in a larger computer analysis. lesson developers a preview of data which might indicate problem skills in the curriculum and serve as a basis for writing student materials and 2) test the feasibility of some For each book, information was tabulated on workbook pages used per child, instructional technique codes used, pre-post grain scores, and actual pre and post-test scores.

In interpreting the results mean pretest scores and mean number of pages used were used to indicate skill difficulty and point out exceptionally difficult or easy skills. Pre- and post-test scores were examined to determine what score range teachers felt indicated mastery on particular skills. Low post-test scores relative to pre-scores were also used to identify possible problem skills. The data pointed out areas for curriculum developers to consider when planning revisions.

Indexed under 5, 7b, 9, 14, 18a, 24.

Unks, Nancy J. *Report on IPI Handwriting Placement Test Analysis.* Research for Better Schools, Inc., 1970.

Handwriting placement tests for all pupils in the six demonstration schools were subjected to item analyses producing item statistics (mean, S.D., and frequency distribution), total score statistics, item inter-correlations, and item-test correlations. The results were reviewed for the consistency of the item difficulties (item means) with similar items and with expectations and for indications of item validities through correlation with total test scores and legibility scores. Items consistent in difficulty with similar items and with expectations were examined logically for possible ambiguity, unclear instructions, or absurd distractors. Items which did not correlate with total score or a legibility score were also examined for the reason behind the lack of correlation. In many cases it was found that they did not correlate because of lack of variance in the item scores. This is one disadvantage of applying correlational analyses to criterion-referenced tests; an item with no variance and no correlational validity would be considered undesirable for norm-referenced tests but may be logically appropriate for criterion-referenced tests such as IPI handwriting placement tests. The conclusion recommended cautious use of the item analysis results for revision of the tests.

Indexed under 5, 7b, 14, 24.

Unks, Nancy J. *Review of IPI Science Prescriptions.* Research for Better Schools, Inc., 1970.

Two hundred eighty-two prescriptions for six units in IPI Science, Level A, done by first and second graders in three IPI demonstration schools were reviewed in order to 1) see if teachers and aides had been able to use the prescription blank to clearly indicate children's work and progress and 2) test the feasibility of a procedure for summarizing data from the prescription sheets so that it would be useful to curriculum developers.

Results indicate that teachers and aides were able to use the form to record pupils' progress within a unit. However, in some cases the particular group lesson or student activity used was not designated. The procedure for summarizing the data seemed to point out some specific problem lessons which should be investigated further.

Indexed under 5, 9, 12, 14, 18a.

Unks, Nancy J. *Summary of Observations on IPI Science in Demonstration Schools.* Research for Better Schools, Inc., 1970.

The operation of the newly implemented IPI sicence program was observed in 5 demonstration schools in April and May 1970. A checklist of expected phenomena to observe was used to help guide and summarize the observations. It was found that various problems involving taped lessons and materials in specific units could be uncovered through this type of observation. The conclusion was that this activity should be continued in the evaluation of the science program and that the checklist should be expanded into a more formal instrument for observation.

Indexed under 5, 9, 12, 9, 14.

Unks, Nancy J. and Cox, R.C. *A Model for the Evaluation of a Testing Program.* Paper presented at the annual meeting of the American Educational Research Association, Chicago, February 1968. Reprinted as Working Paper No. 4, Program of Studies in Educational Research, University of Pittsburgh, 1968.

A generalized four-phase model is presented for evaluating the testing program of an educational innovation concurrent with the total project evaluation. The IPI testing program is used to exemplify the use of the model.

Indexed under 7b, 9.

Unks, Nancy J. With the Assistance of Frances Beizer and Susan DeFelice. *You Are There—A Day in the Life of an IPI Aide.* Research for Better Schools, Inc., September, 1970.

Part I of the paper gives a fictional account of the work life of the aides in an IPI school in order to convey to the reader a subjective feeling for the kinds of work aides do in the context of the school. This part serves as background for understanding Part II.

In Part II, an objective analysis of aides' functions is presented. The instrument used to collect data was a time record filled out by the aides in the IPI demonstration schools during two-week periods in January and April.

Results showed that aides spent the largest block of time scoring children's work in class both in the January and in the April analyses. In the winter, aides spent the next largest amount of time out of the classroom scoring children's work and doing clerical jobs related to organizing completed prescriptions and recording the progress information from them. In the spring the second most time-consuming work category was that of helping children find materials. In both analyses the subjects which took the most aide time were math and reading while handwriting required the least time. Also in both analyses, aides spent a little less time working with the fifth and sixth grades than they did with the lower grades.

Aides usually specialize in one or more subject areas and are designated as "math aides," "science and spelling aides," etc. These special job designations effect the types of tasks the aides perform. Other factors effecting the aides' work seem to include the physical arrangement of the building, state and local policies on paraprofessional help in schools, and the implementation of new programs in the schools.

Tables and graphs of the results for both the winter and spring analyses are included in the paper showing percentages of time spent in different tasks, grades, and subjects by different types of aides and by aides in different schools.

Indexed under 5, 14, 19a.

Washington Conference on IPI. Unpublished Tapescript, Research for Better Schools, Inc., July 1968.

Representatives from RBS, LRDC and USOE, and Panel members, participated in a symposium on the formative evaluation of IPI as an aspect of its continued development as an educational Program.

Robert Glaser: general plan and rationale for IPI
John O. Bolvin: present status of IPI
C. M. Lindvall: IPI evaluation program: description and some results
James Becker: role of RBS in the field development of IPI
Robert Scanlon: specific RBS plans for further field development; administrator and teacher training
Joseph Weinberger: RBS program for monitoring of IPI; specific instruments and procedures
Benjamin Bloom (U. of Chicago): offered comments on general IPI evaluation and field testing; interested in study effects of IPI on different types of children
Nicholas Fattu (U. of Indiana): general problems of the management of instruction

Indexed under 4, 5, 6a, 8, 9, 17, 18c, 19c, 19d.

Weiler, James M. and Joseph DeRenzis. *Oral Test Study.* Research for Better Schools, Inc., 1970.

This study examined the errors made by pupils on the oral tests used in conjunction with the first eight programmed reading books in Stage II Reading. No systematic errors were found. This suggested the need for a greater variety of teaching strategies rather than any specific deficiencies in Stage II Reading.

Indexed under 5, 11, 14.

Weiler, James M. and Joseph De Renzis. *Readability Levels of E Level Reading Skills Materials.* Research for Better Schools, Inc., 1970.

The Fry Readability Formula was applied to skills materials at the E level. The results indicate that pupils with a reading achievement level of grade three can be expected to work in E Level Skills materials successfully.

Indexed under 5, 11.

Weiler, James M., Al Granowsky and Earl Ball. *A Comparison of Recorded and Observed Instructional Settings.* Research for Better Schools, Inc., 1970.

Observations were made in IPI classrooms to determine the instructional settings used by experienced IPI teachers. These observations were compared to the instructional settings recorded on pupil prescription sheets for the same time periods. The data indicate that IPI teacher. utilize many instructional settings during a class period but record only a few of them. Therefore, any analysis of instructional settings based on pupil prescriptions will not yield an accurate picture of actual classroom activity.

Indexed under 5, 11, 14, 18a.

Weiler, James M. *Classification of Reading STS Pages.* Research for Better Schools, 1970.

This study was done to determine the degree to which Reading STS pages could be classified by experienced IPI Reading teachers into one of five categories. Experienced teachers were asked to classify Reading STS pages as review, teaching, practice, or CET pages. Of the Reading Skills 59% were classified with a high degree of agreement. In 17% the degree of agreement among the teachers was so low that the function of the pages in the skill was open to question.

Indexed under 5, 11, 18a.

Weiler, James M. *Difficulty and Readability Level of Directed Reading Selections.* Research for Better Schools, 1970.

The Directed Reading Selections were selected to conform in difficulty and readability level with the IPI Reading level to which they are keyed. This study evaluated the readability of each selection with a standard readability formula and the difficulty of each selection as perceived by trachers and pupils. This objective assessment of the Directed Reading Selections substantiated the assumption that they are of the appropriate difficulty and readability level.

Indexed under 5, 11.

Weiler, James M. *Data Comparison School Pair 1.* Research for Better Schools, Inc., Fall, 1970.

The IPI school was compared with the control school in five studies. Results show that 1) on the Lorge-Thorndike Intelligence test, in grades three through six, the mean group in the Control school centered around 115 in grades 3, 5 and 6 with the fourth grade at 111 with the IPI School around 113 in grades 3, 5 and 6 with the fourth grade at 106. 2) On the Iowa Test of Basic Skills, reading subtests, IPI pupils earned mean grade equivalent scores lower than the non-IPI pupils in grades 3, 4, and 5 and higher in grade 6. On the arithmetic subtests, the IPI grades have lower mean achievement on the ITBS than do the non-IPI pupils.3) On the IPI Mathematics Placement Tests, the IPI pupils were equal to or higher than the non-IPI pupils. 4) On the Purdue Teacher Opinionnaire, the IPI teachers are about as positive, or negative, as the non-IPI teachers on most of the factors. The non-IPI teachers have better feelings about their rapport with their principal and their fellow teachers and about community pressures than do the IPI teachers. 5) On the pupil attitude instrument using the semantic differential technique, the IPI pupils have generally more positive feelsing about self and independent work, while the non-IPI pupils were more positive toward working together as a class.

Weiler, James M. *School Comparison Pair 2.* Research for Better Schools, Inc., Fall, 1970.

The IPI school was compared with the control school in five studies. Results show that: 1) on the Lorge-Thorndike Intelligence Test, in grades three through six, the means for the grades cluster around 110 in both schools. 2) On the Iowa Test of Basic Skills in grades three through six, the IPI pupils earned mean grade equivalent scores equal to or higher than the non-IPI pupils in half the cases on the reading subtests and in five of the eight cases in the mathematics subtests. 3) On IPI Mathematics Placement Tests, the IPI pupils scored higher than the non-IPI pupils. 4) On the Purdue Teacher Opinionnaire, the IPI teachers were statistically significantly more positive toward the principal and higher than the non-IPI teachers on scales of rapport among teachers, teacher load, curriculum issues, and school facilities and services. The non-IPI teachers were high on factors

related to satisfaction with teaching, teacher salary and teacher status. 5) On the pupil attitude instrument using the semantic differential format, the IPI pupils demonstrated a more positive attitude toward self and school and toward the group. The non-IPI pupils were consistent in expressing feelings that language arts are easy.

Weiler, James M. *School Comparison Pair 3.* Research for Better Schools, Inc., Fall, 1970.

The IPI school was compared with the control school in five studies. Results show that: 1) on the Lorge-Thorndike Intelligence Test, the mean IQ earned by the third, fourth, and fifth grade pupils was higher than the Control pupils. The mean intelligence for the sixth grade shows a higher mean for the control pupils. The mean IQ scores center around 100 in the IPI school and around 96 in the Control school for grades 3, 4, and 5 at 101 in grade six IPI and 103 grade 6 Control. 2) On the Iowa Test of Basic Skills, reading the arithmetic subtests, the IPI pupils were lower in mean grade equivalent achievement than the non-IPI pupils. 3) On the IPI Mathematics Placement Tests, the IPI pupils were equal to or higher than the Control pupils 97% of the time. 4) On the Purdue Teacher Opinionnaire, there were few differences, the only two being the IPI teachers reporting less satisfaction with rapport with their paincipal and more satisfaction with curriculum issues and 5) on the pupil attitude instrument using the semantic differential technique, the IPI pupils suggest they have better attitudes about themselves, learning, and school work.

Weiler, James M. *School Comparison Pair 4.* Research for Better Schools, Inc., Fall, 1970.

The IPI school was compared with the control school in five studies. Results show that: 1) on the Lorge-Thorndike Intelligence test, in grades three and four, the mean group IQ is more than 7 points lower at the IPI School than at the Control School, and the fourth grade pupils earned lower mean scores than did the third grade pupils. 2) On the Iowa Test of Basic Skills in reading and arithmetic subtests, the achievement of the IPI pupils is lower than the achievement of the non-IPI pupils in all cases. 3) On the IPI Mathematics Placement Tests, the IPI pupils were equal to or higher than the non-IPI pupils in 97% of the comparisons. 4) On the Purdue Teacher Opinionnaire, the IPI teachers significantly less satisfied with facilities and services and that the extra effort demanded by IPI is not excessive while the teachers at the control school were significantly higher on rapport among teachers and 5) on the pupil opinionnaire using the semantic differential instrument, there were no significant differences.

Weiler, James M. *School Comparison Pair 5.* Research for Better Schools, Inc., Fall, 1970.

The IPI school was compared with the control school in five studies. Results show that: 1) on the Lorge-Thorndike Intelligence Test, the mean IQ earned by the IPI pupils is consistently a few points higher than the mean IPI earned by the Control pupils: centering around 90 for the IPI pupils and 86 for the control pupils, 2) on the Iowa Test of Basic Skills, reading subtests, the IPI pupils earned mean grade equivalent scores equal to or higher than the non-IPI pupils and in grade four earned a mean grade equivalent score of one and two months lower than the non-IPI pupils, 3) on the IPI Mathematics Placement Tests, the IPI pupils were equal to or higher than the non-IPI pupils in achievement, 4) on the Purdue Teacher Opinionnaire, the IPI teachers were more positive than control teachers on every factor except Teacher Salary and, 5) on the pupil attitude instrument using the semantic differential technique, there were few differences among pupils.

Weiler, James M. *School Comparison Pair 6.* Research for Better Schools, Inc., Fall, 1970.

The IPI school was compared with the control school in five studies. Results show that: 1) on the Lorge-Thorndike Intelligence Test, in grades three through six, the means cluster around 105 except in the fourth grade in the IPI school which is lower. 2) On the Iowa Test of Basic Skills, reading and arithmetic subtests, the IPI and non-IPI pupils are achieving at about the same rate. 3) On the IPI Mathematics Placement Tests, the IPI pupils were equal to or superior to the non-IPI pupils in 91% of the comparisons. 4) On the Purdue Teacher Opinionnaire, the only significant difference was the non-IPI teachers feeling better about the rapport they had with their principal than the IPI teachers and, 5) on the pupil attitude instrument using the semantic differential format, the IPI pupils were much less group oriented than the non-IPI pupils.

Indexed under 5, 7b, 10, 11, 14, 15b, 15c, 16a, 16b, 20.

Weinberger, JoAnn. *Reports of Comparison between Iowa Test of Basic Skills—Form 4 and IPI Continuum.* Research for Better Schools, Inc., November 1968.

Comparison of ITBS with the IPI continuum and placement tests by two independent raters (reconciled by a third when necessary). Results showed that very few ITBA items were in the IPI continuum. Of the 418 skills in the IPI math continuum, 26% were tested by the ITBS. Of the 147 skills on the IPI placement test, 27.9% were tested on the ITBS.

Indexed under 5, 9, 10, 15b, 15c, 20.

Weinberger, JoAnn. *Degree of Implementation of IPI 1967-68 Summary Report.* Research for Better Schools, 1968.

The degree of implementation of IPI was assessed for each teacher in the nineteen schools involved in IPI mathematics during 1967-68. The criterion questions on which the study was based were selected for their importance in the teacher's adherence to the mastery criterion, the correct administration of tests, and variations in prescription writing.

Indexed under 5, 9, 10, 14, 18a.

Weinberger, JoAnn. *Temporal Retention Study on IPI Mathematics.* Unpublished paper, Research for Better Schools, Inc., April 1969.

The purpose of this study was to determine the necessity of placement testing pupils at the beginning of each school year. Data were extracted from the Spring and Fall placement profiles of 1,231 pupils in four IPI schools; and the number of units gained or lost over the summer were calculated by grade level and area in the continuum. The results showed no overall difference, except that certain units were noted for their dominance of gains or losses in particular grades. It was concluded that it is not necessary to placement test pupils each September.

Indexed under 5, 7b, 10, 15b, 15d.

Weinberger, JoAnn. *The Use of Data in Monitoring School Implementation of Individually Prescribed Instruction.* Unpublished paper, Research for Better Schools, Inc., 1969. (Paper presented at the annual meeting of the American Educational Research Association, Los Angeles, 1969.)

The monitoring and evaluation system has been devised to meet the following purposes: 1) to assist school personnel by providing feedback on their use of the system, along with ways in which they can improve; 2) to appraise the training materials by determining if the goals and elements of IPI are upheld in actual field settings; 3) to provide the Learning Research and Development Center and Research for Better Schools with the developmental information needed for refining and improving the IPI system.

Three major instruments provide the source of information: 1) The Degree of Implementation Report (criteria for utilizing IPI procedures); 2) Report of Student Progress (placement and progress data); and 3) school visitation monitor reports.

Indexed under 5, 7b, 9, 10, 14, 15a, 18a, 19d.

Weinberger, JoAnn. *IPI Mathematics. A Report on the Results of 1968-69 Prescription Analysis.* Research for Better Schools, 1969.

The number of CET's and post-tests required to mastery in Levels A-C are analyzed. Report includes listing of those skills in which 25% or more of the pupils required three or more CET's and two or more post-tests.

Indexed under 5, 7b, 10, 14.

Weinberger, JoAnn. *Comparison of School Pair 4 Pupils.* Research for Better Schools, Inc., August 1969.

High and Low IQ IPI and Control pupils, grades 4-6, were compared on the IPI Placement Tests and the Iowa Test of Basic Skills Arithmetic Concepts and Problem Solving.

Results show, on IPI Placement Tests, a significant difference in favor of IPI for 1) Grade 4 high and low IQ pupils, 2) Grade 5 high and low IQ pupils, 3) Grade 6 high and low IQ pupils.

On the Iowa Test of Basic Skills there is no significant difference between IPI and Control schools on arithmetic concepts or problem solving.

Indexed under 5, 10, 14, 15b, 15c, 20.

Weinberger, JoAnn. *Report of Student Progress 1968-69.* Research for Better Schools, Inc. 1969.

The results of this study are summarized in three parts: 1) Placement Testing Distribution, entering behavior; 2) Degree of Implementation Assessment, in examining each teacher and school report, every class illustrated individualization; 3) variability in skills mastered, three types of variability was found: by grade level, by current level, by area.

Indexed under 5, 7b, 10, 14.

Weinberger, JoAnn. *Summary of IPI Planning Session Records.* Research for Better Schools, Inc., 1968-69

Report deals with planning session time, agendas, topics and attendance. Data is presented for the Demonstration Schools, the Implementation Schools, and all schools.

Indexed under 5, 10, 14, 18c.

Weinberger, JoAnn. *Summary and Comparison of Three Annual Conferences ('67 - '68 - '69) of Teachers and Administrators Using the Instructional System Individually Prescribed Instruction.* Research for Better Schools, Inc., 1969.

Responses from participants over three year period are presented. Incisive positive and negative comments have called attention to important aspects of the program and greatly contributed to changes made. Particular results to be noted include: teachers perceive their role as more important than in traditional classrooms; in addition, they feel the demands are greater on their classroom functions and on preparation time; teachers perceive IPI with positive attitude.

Indexed under 5, 14, 16b.

Weinberger, JoAnn. *Summary of Achievement Study Comparing Individually Prescribed Instruction with Traditional Methods 1967-1969.* 1969.

A report is given on the results of an analysis of variance involving data on IPI and control pupils on the IPI Mathematics Placement Tests and the Iowa Test of Basic Skills.

Indexed under 5, 10, 14, 15b, 15c, 20.

Weinberger, JoAnn and Scharf, Eugenia. *An Anthology of Comments by Pupils in Individually Prescribed Instruction.* Research for Better Schools, Inc., summer 1969.

To elicit feelings regarding mathematics in particular and school in general, three questions were asked of all pupils in grades 4, 5, and 6 at the five IPI demonstration schools. The three questions constituted Part I of a Pupil Opinionnaire, "What Do You Think?" administered in April 1969. They were:

1. What do you like about math?
2. What do you not like about math?
3. What would you say if your best friend asked you, "Do you like school?" Write down here just what you would say. If you like some parts of school, say why you like them. If you dislike some parts of school, say why you don't like them.

Some of the more interesting, as well as representative reactions to thses questions are contained in the anthology.

Indexed under 5, 14, 18a.

Weinberger, JoAnn and Scharf, Eugenia. *Pupil Opinionnaire: "What Do You Think?"* Research for Better Schools, Inc., 1969.

A three part opinionnaire was administered to IPI and Control pupils in grades 4, 5, and 6. The open-ended questions, semantic differential technique and the multiple-choice items showed that IPI has a positive effect on pupil's attitudes toward the specific subject of mathematics and toward school experience in general.

Indexed under 5, 10, 14, 16a, 20.

Welty, Gordon. *Cost-Benefit Analysis: Preliminary Reporting.* Research for Better Schools, Inc., 1970.

Study undertaken to determine all costs of IPI through fiscal year 1969.

Indexed under 5, 9.

Winchell, Leonard T. *A Comparison of Objective and Subjective Testing Instruments in the Individually Prescribed Instruction Methematics Program.* Experiment conducted at Richland Elementary School, Quakertown, Pennsylvania, February 3 to March 28, 1969. (Systems Design Division, Westinghouse Learning Corporation). July 30, 1969.

Study includes a description of the effort to develop multiple-choice, machine scoreable IPI pre- and post-tests. Fourth, fifth, and sixth grade students at Richland reaching Units D-SOM, E-Fractions, and F-PV took both the regular IPI test and a multiple-choice version (WL). Half the group took the former first; half took it second.

Assorted statistical techniques were used to determine what the obtained data meant, but in five out of the six cases, the multiple-choice test scores were higher. Conclusions are impossible as: 1) the sample was very small; 2) post-test scores are extremely skewed by definition and cannot be treated as a normal distribution; taking one test first (especially the WL) influences the score on the second. IPI students had no difficulty with the multiple-choice format.

Indexed under 7b, 10, 14.

Wilson School, State Home for Boys, Jamesburg, New Jersey. *Data Summary for IPI Testing.* March 1969.

The population consisted of boys in the Manual Education Department (those who functioned some three to four grades below level). Half the group had IPI math (although only

63% of these had as much as two months of it), and half the group had traditional math. The Stanford Achievement Test, Form W was administered at the beginning of the boys' entrance into the program, and Form X was used for retesting. Results showed an average grade level improvement for the three tests of .74 for IPI and .27 for Control. The conclusion (without any tests of statistical significance of the differences) was that "IPI yielded better results in arithmetic than the traditional approach."

Indexed under 10, 14, 15c, 20.

Yeager, John L. and Kissel, Mary Ann. *An Investigation of the Relationship Between Selected Student Characteristics and Time Required to Achieve Unit Mastery.* Working Paper 46, Learning Research and Development Center, University of Pittsburgh, March 1969.

It was found that the number of days a student requires to master a given unit is related to the student's initial entering stage; i.e. the unit pretest score, number of skills to be mastered and student's age. The first two factors are indicators of the amount of work to be completed before mastery, and thus, are closely connected with the required amount of time. There is no correlation between I.Q. and time to master a unit. This supports earlier findings that I.Q. is not an important factor in making progress in IPI as long as the student is capable of mastery.

Indexed under 4, 10, 15a.

Yeager, J. L. and Lindvall, C. M. *Evaluating an Instructional Innovation Through the Observation of Pupil Activities.* The High School Journal, 51:248-253, 1968. Reprint 34, Learning Research and Development Center, University of Pittsburgh, 1968.

Description of major categories used in an observation schedule for evaluating pupil classroom activities in IPI is presented. Sample data is given comparing Oakleaf with another school implementing IPI.

Indexed under 4, 6a, 9, 10, 13, 14, 17, 18b, 19a.

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